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UNITED STATES. FEDERAL COMMUNICATIONS COMMISSION.
RADIO SERVICE BULLETIN, no. 1-20.
January, 1915-August 1, 1916.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, January, 1915—No. 1

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instructions, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the list of Radio Stations of the United States, and will contain information concerning Government, commercial, and special stations only. Information regarding amateur stations will appear only in the annual edition of the list of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the list of Radio Stations of the United States and the list of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) will be printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws will be printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
E. F. SWEET,
Acting Secretary.

ABBREVIATIONS.

INTERNATIONAL ABBREVIATIONS USED IN THIS LIST.

Nature of service:

- PG=General public.
 PR=Limited public or limited commercial.
 P=Private.
 O=Government business exclusively.

Hours of operation:

- N=Continuous service.
 X=No regular hours.
 m=a. m.
 s=p. m.
 12 m=Midday.
 12 s=Midnight.
 fr.=Franc (francs).
 c.=Cents.

OTHER ABBREVIATIONS.

- Name =Name of station.
 G. loc. =Geographical location (O=west longitude, N=north latitude).
 Call =Radio call letters.
 System=Radio system used and sparks per second.
 Range =Normal range in nautical miles.
 W. L. =Wave lengths.
 Service=Nature of service.
 Hours =Hours of operation.
 Rates =Ship or coast charges in francs and dollars.
 Notes =Refers to notes in the Berne list.

NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

Additions to the list of Radio Stations of the United States, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Longitude and latitude (approximate).	Call signal.	Range.	System.	Wave lengths.	Service.	Hours.
Benton Harbor, Mich. ¹	O 86 28 21 N 42 06 42	WIZ	125	Marconi, 125...	300,500,600	PR ² ...	X.
Huntington Harbor, Northport, N. Y. ³	.....	WLM	.....	.....	.....	.....	.....
Oakland, Cal. ⁴ ...	O 122 16 14 N 37 48 41	KGI	200	Composite, 540	300,500,600	P.....	X.
Passagrille, Fla. ⁵ .	O 82 45 00 N 27 42 00	WRG	20	.....	300,450,600	PG ⁶ ...	8.30m-11.30m. 1.30s- 3.00s. 4.30s- 6.30s. 7.30s-10.00s.
St. Petersburg, Fla. ⁷	O 82 38 27 N 27 46 28	WIX	25-50	.....	300,450,600	PR ⁸ ...	8.30m-11.30m. 1.30s- 3.00s. 4.30s- 6.30s. 7.30s-10.00s.

¹ Radio station operated and controlled by the Graham & Morton Transportation Co.

² The vessel communicates only with vessels of the Graham & Morton Transportation Co.

³ Radio station operated and controlled by W. K. Vanderbilt, jr.

⁴ Radio station operated and controlled by Ellery W. Stone.

⁵ Radio station operated and controlled by C. A. Brown.

⁶ The station also communicates with a land station at St. Petersburg (WIX), Fla. The rates for this station are as follows:

	Per word.	Minimum per radiogram.
Ordinary day messages.....	2 c. (0.10 fr.)	(10 words) 35 c. (1.75 fr.)
Ordinary night messages.....	2 c. (0.10 fr.)	(10 words) 25 c. (1.25 fr.)
Day letters.....	4 c. (0.20 fr.)	(50 words) 55 c. (2.75 fr.)
Night letters.....	2 c. (0.10 fr.)	(50 words) 35 c. (1.75 fr.)

⁷ Radio station operated and controlled by C. C. Brown.

⁸ The station is limited to correspondence with a land station at Passagrille (WRG), Fla. Rates for this station same as Passagrille (no ship service).

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the list of Radio Stations of the United States, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name.	Call signal.	System.	Wave lengths.	Ship rate.	
				Per word.	Minimum per radiogram.
Addison E. Bullard ¹	KWL		300, 600		
Alberta ²	KZA				
Baton Rouge ³	KSG		300, 600		
Bayway ⁴	KSR		300, 600		
Brockton ⁵	KNH		300, 600		
Caddo ⁶	KSK		300, 600		
Caloria* ⁷	KSD	Marconi.	300, 600	4 c. (0.20 fr.)	40 c. (2 fr.)
Charles E. Harwood* ⁸	WID	do	300, 600	4 c. (0.20 fr.)	40 c. (2 fr.)
Charlton Hall ⁹	KLU		300, 600		
Colusa* ¹⁰	WIN	Marconi.	300, 600	4 c. (0.20 fr.)	40 c. (2 fr.)
Craster Hall ¹¹	KLK		300, 600		
Cushing (KSC) ¹²	KSC		300, 600		
De Soto ¹³	KNI		300, 600		
Edward L. Doheny* ¹⁴	WIE		300, 600	4 c. (0.20 fr.)	40 c. (2 fr.)
Emeline ¹⁵	KZD				
Francis Hanify* ¹⁶	KRA	Marconi, 1,000.	300, 600	4 c. (0.20 fr.)	40 c. (2 fr.)
Gargoyle ¹⁷	KRK		300, 600		
Great Northern* ¹⁸	WIR	Marconi, 1,000.	300, 600	4 c. (0.20 fr.)	40 c. (2 fr.)
Hert G. Wylie* ¹⁹	WIF	Marconi.	300, 600	4 c. (0.20 fr.)	40 c. (2 fr.)
Howick Hall* ²⁰	KLT	do	300, 600	4 c. (0.20 fr.)	40 c. (2 fr.)
Llama* ²¹	KSI	do	300, 600	4 c. (0.20 fr.)	40 c. (2 fr.)
Lyman Stewart ²²	WTL		300, 600		
Maracas* ²³	KMR	Marconi.	300, 600		
Motano ²⁴	KSB		300, 600		
Norman Bridge* ²⁵	WIG	Marconi.	300, 600	4 c. (0.20 fr.)	40 c. (2 fr.)
Olson & Mahony† ²⁶	WIK	Composite, 375.	300, 600	2 c. (0.10 fr.)	20 c. (1 fr.)
Princeton (KST) ²⁷	KST		300, 600		
Sandy Hook ²⁸	KNJ		300, 600		
Santa Clara (KIR) ²⁹	KIR		300, 600		
Somerset (KSU) ³⁰	KSU		300, 600		
Tarantula ³¹	KZT				
Winchester* ³²	KZK				

*Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.

†Radio station operated and controlled by the Golden Gate Transportation Co.

¹ J. B. Crocker, owner of vessel.

² F. D. Bourne, owner of vessel.

³ Standard Oil Co. of New Jersey, owner of vessel.

⁴ Colonial Navigation Co., owner of vessel.

⁵ Petroleum Transport Co., owner of vessel.

⁶ United States Steel Products Co., owner of vessel.

⁷ W. R. Grace & Co., owner of vessel.

⁸ Robert Graves, owner of vessel.

⁹ G. R. Hanify & Co., owner of vessel. The station has a range of 100 miles, general public service, with no regular hours.

¹⁰ Vacuum Oil Co., owner of vessel.

¹¹ Great Northern Pacific Steamship Co., owner of vessel. The station has a range of 150 miles, general public service, with continuous hours.

¹² Union Oil Co. of California, owner of vessel.

¹³ New York Transatlantic Steamship Co. (Inc.), owner of vessel.

¹⁴ Olson & Mahony, owner of vessel. The station has a range of 200 miles, general public service, with no regular hours.

¹⁵ United New York & Sandy Hook Pilot's Association, owner of vessel.

¹⁶ American & Cuban Steamship Line, owner of vessel.

¹⁷ W. K. Vanderbilt, jr., owner of vessel.

¹⁸ Irving Cox, owner of vessel.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Station.	Call signal.	Station.
KGI	Oakland, Cal.....c	KSU	Somerset.....b
KIR	Santa Clara.....b	KWL	Addison E. Bullard.....b
KLK	Craster Hall.....b	KZA	Alberta.....b
KLT	Howick Hall.....b	KZD	Emeline.....b
KLU	Charlton Hall.....b	KZK	Winchester.....b
KMR	Maracas.....b	KZT	Tarantula.....b
KNH	Brockton.....b	WID	Charles E. Harwood.....b
KNI	De Soto.....b	WIE	Edward L. Doheny.....b
KNJ	Sandy Hook.....b	WIF	Herbert G. Wylie.....b
KRA	Francis Hanify.....b	WIG	Norman Bridge.....b
KRK	Gargoyle.....b	WIK	Olson & Mahony.....b
KSB	Motano.....b	WIN	Colusa.....b
KSC	Cushing.....b	WIR	Great Northern.....b
KSG	Baton Rouge.....b	WIX	St. Petersburg, Fla.....c
KSI	Llama.....b	WIZ	Benton Harbor, Mich.....c
KSK	Caddo.....b	WLM	Huntington Harbor, Northport, N. Y.....c
KSP	Caloria.....b	WRG	Passagrille, Fla.....c
KSR	Bayway.....b	WTL	Lyman Stewart.....b
KST	Princeton.....b		

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the list of Radio Stations of the United States only.]

Station.	Call signal.	Wave lengths.*	Service.	Hours.	Station controlled by—
Montgomery, Ala.....	5ZI	300, 600, 1625, 1800.....	P	X	Wm. H. Amerine (Signal Corps, Ala. Nat. Guard).
Pacific Grove, Cal.....	6ZB	300, 500, 800.....	P	X	Howard S. Bunting.
Richmond, Va.....	3ZK	500, variable.....	P	X	Frank S. Splatt (Signal Corps, Va. Nat. Guard).
Schenectady, N. Y.....	2XA	300, 600, 1000, 1200, 1700.	P	X	E. M. Kinney.

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
2XA	Second district: Schenectady, N. Y.	5ZI	Fifth district: Montgomery, Ala.
3ZK	Third district: Richmond, Va.	6ZB	Sixth district: Pacific Grove, Cal.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the list of Radio Stations of the United States, and in the International List of Radiotelegraph Stations published by the Berne bureau.]

- ASTORIA, OREG.**—Rates, North and South American service, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram.
- AVALON, CAL.**—W. L., 300, 527, 600.
- BALBOA, PANAMA.**—Rates, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram.
- BALTIMORE, MD.**—Range, 125.
- BOSTON (WBF), Mass.**—Range, 200; system, Marconi, 218.
- BROOKLYN, N. Y.**—System, Fessenden, 250-1000; W. L., 300, 600, 1650, 1800, 2600, 3600; service, PG and PR; hours, 4m-12m, 1s-9s; rates, North and South American service, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram; transoceanic service, 12 c. (0.60 fr.) per word, \$1.20 (6 fr.), minimum, per radiogram; ships plying between New York City and points distant not more than 200 miles by water, 3 c. (0.15 fr.) per word, 30 c. (1.50 fr.), minimum, per radiogram. Strike out Note.
- BUFFALO, N. Y.**—Range, 185; system, Marconi, 50; hours, Apr. 15-June 3, 7s-12s, 1m-7m; June 3-Sept. 15, 7m-12m, 1s-6s, 7s-12s, 1m-6m; Sept. 15-Dec. 15, 7s-12s, 1m-7m.
- BURRWOOD, LA.**—Range, 400; system, composite, 500; W. L., 300, 600, 1650, 1800; service, PG and PR; hours, 7m-7.05m, 9m-9.05m, 11m-11.05m, 2s-2.05s, 4s-4.05s, 7s-7.05s; rates, PG service, 12 c. (0.60 fr.) per word, \$1.20 (6 fr.), minimum, per radiogram, PR service to New Orleans (WNU), La., 5 c. (0.25 fr.) per word, without minimum. Notes, Station also corresponds with a station at Cape San Antonio, Cuba, and one at New Orleans (WNU), La. The operator listens in at intermittent times on the hour and half hour.
- CALUMET, MICH.**—Range, 150; system, Marconi, 120; W. L., 300, 600; service, PG; hours, 8m-1s, 2s-7s, 8s-1m, 2m-7m; rates, 3 c. (0.15 fr.) per word, 30 c. (1.50 fr.), minimum, per radiogram.
- CAPE BLANCO, OREG.**—Rates, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum per radiogram.
- CAPE HATTERAS, N. C.**—Range, 200; system, Marconi, 240.
- CAPE MAY, N. J.**—System, Marconi, 240.
- CHICAGO, ILL.**—Range, 150; system, Marconi, 120.
- CLEVELAND, OHIO.**—Range, 150; system, Marconi, 120; hours, 9m-12m, 12.30s-8s, 9s-11s, 12s-8m.
- COLON, PANAMA.**—Rates, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram.
- DAYAO, P. I.**—Note, Radio station operated and controlled by the Philippine insular government.
- DETROIT, MICH.**—G. loc., O 83° 07' 15", N 42° 15' 17"; system, Marconi, 120.
- DOUGLAS, ARIZ.**—System, Marconi, 480.
- DULUTH, MINN.**—Range, 150; system, Marconi, 120; hours, 8m-12m, 1s-7s, 8s-12s, 1m-7m.
- EAST SAN PEDRO, CAL.**—System, Marconi, 235; rates, North and South American service, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram, transoceanic service, 12 c. (0.60 fr.) per word, \$1.20 (6 fr.), minimum, per radiogram, to ships *Hermosa* and *Cabrillo*, 2 c. (0.10 fr.) per word, 20 c. (1 fr.), minimum, per radiogram (address and signature free of charge), for radiotelegrams exchanged with Avalon, Catalina Island, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- EL PASO, TEX.**—Notes, The station is reserved for limited public service overland with Fort Worth, Tex., Los Angeles (KLS), and South San Francisco, Cal. The station applies special zone rates, which may be obtained upon application to the Federal Telegraph Co.
- ENSENADA, P. R.**—G. loc. (approximate), O 66° 57' 00", N 17° 59' 00"; range, 250; system, Marconi, 240; W. L., 300, 600, 1610; service, PG and PR; hours, week days, 8m-6s, Sundays, 9m-12m; rates, to ships, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram; to San Domingo City, La Romana, and San Pedro Macorras, 12 c. (0.60 fr.) per word, without minimum.
- EUREKA (NPW), CAL.**—Rates, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram.

EUREKA (KPM), CAL.—Rates, North and South American service, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram, transoceanic service, 12 c. (0.60 fr.) per word, \$1.20 (6 fr.), minimum, per radiogram.

FORT MILLS, P. I.—Service, PG.

FORT MORGAN, ALA.—Service, PG and PR; hours, PG service, 7.10m-7.20m, 7.40m-7.50m, 8.10m-8.20m, 8.40m-8.50m, 9.10m-9.20m, 10.10m-10.20m, 10.40m-10.50m, 11.10m-11.20m, 11.40m-11.50m, 12.10s-12.20s, 2.10s-2.20s, 2.40s-2.50s, 3.10s-3.20s, 3.40s-3.50s, 4.10s-4.20s, 4.40s-4.50s, 5.10s-5.20s, 5.40s-5.50s, 6.10s-6.20s; PR service, 7.00m-7.10m, 7.30m-7.40m, 8.00m-8.10m, 8.30m-8.40m, 9.00m-9.10m, 10.00m-10.10m, 10.30m-10.40m, 11.00m-11.10m, 11.30-11.40, 12.00m-12.10s, 2.00s-2.10s, 2.30s-2.40s, 3.00s-3.10s, 3.30s-3.40s, 4.00s-4.10s, 4.30s-4.40s, 5.00s-5.10s, 5.30s-5.40s, 6.00s-6.10s; rates, to ships, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram; PR service with Mobile, Ala., 10 c. (0.50 fr.) per word, \$2 (10 fr.), minimum, per radiogram. Note, The station also corresponds with Mobile, Ala.

FRANKFORT, MICH.—System, Marconi, 120; service, PG; hours, 8m-12m, 1s-7s; rates, 3 c. (0.15 fr.) per word, 30 c. (1.50 fr.), minimum, per radiogram. Strike out Notes.

FRIDAY HARBOR, WASH.—System, Marconi, 120; rates, North and South American service, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram, transoceanic service, 12 c. (0.60 fr.) per word, \$1.20 (6 fr.), minimum, per radiogram.

GALVESTON, TEX.—System, Marconi, 400.

GRAND HAVEN, MICH.—Service, PG; hours, 7m-12m, 8s-11s. Strike out Note.

GRAND MARAIS, MINN.—System, Marconi, 120; service, PG. Strike out Note.

GUANTANAMO BAY, CUBA.—Rates, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram.

HEEIA POINT, HAWAIIAN ISLANDS.—Note, The station communicates only with south San Francisco, Cal.; minimum, per radiogram, 75 c. (3.75 fr.), special count.

HILLCREST (DALY CITY), CAL.—System, Marconi, 120; rates, North and South American service, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram, transoceanic service, 12 c. (0.60 fr.) per word, \$1.20 (6 fr.), minimum, per radiogram.

HOLLISTER, CAL.—System, composite, 466. Strike out Note.

HULL, MASS.—G. loc., O 70° 54' 00'', N 48° 18' 22''; range, 100; system, composite, 1,000.

JACKSONVILLE, FLA.—G. loc., O 81° 38' 56'', N 30° 19' 25''; range, 150.

KEY WEST, FLA.—Rates, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram.

LOS ANGELES (KEX), CAL.—System, Marconi, 120.

LUDINGTON, MICH.—System, Marconi, 120; hours, 12.30m-6m, 7.30m-11.30m, 1s-5.30s, 7.30s-11.30s, when lake is open to navigation. Strike out Notes.

MACKINAC ISLAND, MICH.—G. loc. (approximate), O 84° 35' 00'', N 45° 54' 00''; range, 150; system, Marconi, 120; W. L., 600; service, PG; hours, 8m-12m, 2s-5s, 8s-9s; rates, 3 c. (0.15 fr.) per word, 30 c. (1.50 fr.), minimum, per radiogram.

MANISTIQUE, MICH.—Range, 125; system, Marconi, 240; W. L., 300, 600; service, PG; hours, 8m-11m, 2s-5s, 7s-9s; rates, 3 c. (0.15 fr.) per word, 30 c. (1.50 fr.), minimum, per radiogram.

MANITOWOC, WIS.—Range, 125.

MARSHFIELD, OREG.—System, Marconi, 120; rates, North and South American service, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram, transoceanic service, 12 c. (0.60 fr.) per word, \$1.20 (6 fr.), minimum, per radiogram.

MIAMI, FLA.—Range, 300; system, Marconi, 240; W. L., 300, 550, 600.

MILWAUKEE, WIS.—Hours, 1.30m-7m, 8m-12m, 1s-6s, 8s-12.30m. Strike out Notes.

MOBILE, ALA.—Service, PG and PR; hours, PG service, 7.10m-7.30m, 7.40m-8.00m, 8.10m-8.30m, 8.40m-9.00m, 10.10m-10.30m, 10.40m-11.00m, 11.10m-11.30m, 11.40m-12m, 2.10s-2.30s, 2.40s-3.00s, 3.10s-3.30s, 3.40s-4.00s, 4.10s-4.30s, 4.40s-5.00s, 5.10s-5.30s, 5.40s-6.00s; PR service, 7.00m-7.10m, 7.30m-7.40m, 8.00m-8.10m, 8.30m-8.40m, 9.00m-9.10m, 10.00m-10.10m, 10.30m-10.40m, 11.00m-11.10m, 11.30m-11.40m, 12m-12.10s, 2.00s-2.10s, 2.30s-2.40s, 3.00s-3.10s, 3.30s-3.40s, 4.00s-4.10s, 4.30s-4.40s, 5.00s-5.10s, 5.30s-5.40s, 6.00s-6.10s; rates, for service with ships, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram; PR service with Fort Morgan, Ala., 10 c. (0.50 fr.) per word, \$2 (10 fr.), minimum, per radiogram. Note, Station also corresponds with Fort Morgan, Ala.

NEW LONDON (WLC), CONN.—Range, 100; system, Fessenden, 120.

NEW ORLEANS (WHK), LA.—G. loc. (approximate), O 90° 07' 00'', N 29° 59' 00''; range, 200; system, Marconi, 400.

NEW ORLEANS (WNU), LA.—Range, 400; system, composite, 1000; W. L., 300, 600, 1800, 1850; service, PG, PR, and P; hours, N; rates, for service with ships, 12 c. (0.60 fr.) per word, \$1.20 (6 fr.), minimum, per radiogram. PR service rates (charges per word, cable count, no minimum), as follows:

	Francs.	Cents.
Belize, British Honduras.....	0.875	17.5
Bluefields, Nicaragua.....	1.125	22.5
Bocas del Toro, Panama.....	1.375	27.5
Burwood, La.....	.25	5.0
Ceiba, Spanish Honduras.....	1.25	25.0
Colon, Panama.....	1.00	20.0
Port Limon, Costa Rica.....	1.25	25.0
Puerto Barrios, Guatemala.....	1.125	22.5
Puerto Cortez, Spanish Honduras.....	1.125	22.5
Santa Marta, Colombia.....	1.875	37.5
Swan Island.....	.625	12.5
Tela, Spanish Honduras.....	1.125	22.5
Truxillo, Spanish Honduras.....	1.125	22.5

NEWPORT (WCI), R. I.—System, Fessenden, 260.

NEWTON, MASS.—System, Clapp-Eastham, 2000; service, P.

NEW YORK (WHB).—System, Wireless Specialty Apparatus Co., 1000; rates, North and South American service, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram, transoceanic service, 12 c. (0.60 fr.) per word, \$1.20 (6 fr.), minimum, per radiogram.

NEW YORK (WNT).—Range, 150; system, Telefunken, 1000; hours, 9m-5s, except Sundays and holidays.

NORTH HEAD, WASH.—Rates, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram.

PHILADELPHIA (WHE), PA.—System, Marconi-United, 240; W. L., 300, 600, 1650; hours, 8m-12s.

POINT ARGUELLO, CAL.—Rates 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram.

PORT ARTHUR, TEX.—G. loc., O 93° 55' 35'', N 29° 52' 46''; system, Marconi, 400.

SAN DIEGO (NPL), CAL.—Rates, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram.

SAN JUAN, P. R.—Rates, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram.

SAN LUIS OBISPO, CAL.—G. loc. (approximate), O 120° 45', 00'', N 35° 10' 00''; range, 150; system, Marconi, 240; rates, North and South American service, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram, transoceanic service, 12 c. (0.60 fr.) per word, \$1.20 (6 fr.), minimum, per radiogram.

SAVANNAH, GA.—Range, 200; system, Marconi-United, 240; W. L., 300, 500, 600.

SAYVILLE, N. Y.—Strike out all particulars regarding limited public-service station.

SAYVILLE, N. Y. (PG station).—Hours, 2m-2s.

SEATTLE, WASH.—Range, 200; system, Marconi, 120; rates, North and South American service, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram, transoceanic service, 12 c. (0.60 fr.) per word, \$1.20 (6 fr.), minimum, per radiogram.

SIASCONSET, MASS.—System, Marconi, 480.

SOUTH SAN FRANCISCO, CAL.—Note, Station reserved for correspondence with El Paso, Tex., and Heeia Point (near Honolulu), Hawaiian Islands. Rates, 75 c. (3.75 fr.) per radiogram, special count.

SOUTH WELFLEET, MASS.—System, Marconi, 120-233; W. L., 300, 600, 2100; rates, North and South American service, 6 c. (0.30 fr.), per word, 60 c. (3 fr.), minimum, per radiogram, transoceanic service, 12 c. (0.60 fr.) per word, \$1.20 (6 fr.), minimum, per radiogram, distances exceeding 400 miles, 42 c. (2.10 fr.) per word, \$4.20 (21 fr.), minimum, per radiogram.

TAMPA, FLA.—System, Marconi, 400.

TATOOSH, WASH.—Rates, 6 c. (0.30 fr.) per word, 60 c. (3 fr.), minimum, per radiogram.

TUTUILA, SAMOA.—Rates, 5 c. (0.25 fr.) per word, 50 c. (2.50 fr.), minimum, per radiogram.

VIRGINIA BEACH, VA.—System, Marconi, 240; W. L., 300, 550, 600.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made in the list of Radio Stations of the United States, and in the International List of Radiotelegraph Stations published by the Berne bureau.]

- ABANGAREZ.**—Range, 500; system, Wireless Specialty Apparatus Co., 1000; hours, N; rates, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- ADELINE SMITH.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Note, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.
- ADMIRAL DEWEY.**—System, Marconi, 240; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram; hours, N.
- ADMIRAL EVANS.**—System, Marconi; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- ADMIRAL FARRAGUT.**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram. Note, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.
- ADMIRAL SAMPSON.**—Strike out all particulars.
- ADMIRAL SCHLEY.**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- ADMIRAL WATSON.**—Range, 150; system, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- ADVANCE.**—Range, 300; system, Telefunken, 1000.
- A. G. LINDSAY.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Note, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.
- ALABAMA (KSX).**—Strike out all particulars.
- ALABAMA (KUN).**—Range, 200; system, Marconi, 240; hours, X; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- ALABAMA (WFB).**—Range, 150; system, Marconi, 120.
- ALAMEDA.**—Range, 200; system, Marconi, 120; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- ALAMO.**—System, Marconi, 400.
- ALASKAN.**—Range, 200; system, Telefunken, 1000; hours, 9m-12m, 2s-5s, 8s-10.30s; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- ALBATROSS.**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- ALGONQUIN (KVG).**—System, Marconi, 120.
- AL-KI.**—System, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram. Note, Northland Steamship Co., owner of vessel.
- ALLIANÇA.**—Range, 300; system, Telefunken, 1000; W. L., 300, 450, 600. Note, Radio station operated and controlled by the Atlantic Communication Co.
- ALLIANCE.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Note, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.
- AMERICAN.**—Range, 200; system, Telefunken, 1000; hours, 9m-12m, 2s-5s, 8s-10.30s; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- ANCON.**—Range, 300; system, Telefunken, 1000; W. L., 300, 400, 500, 600.
- ANN ARBOR, No. 3.**—Range, 125; system, Marconi, 120; hours, N.
- ANN ARBOR, No. 4.**—Range, 125; system, Marconi, 120; hours, N.
- ANN ARBOR, No. 5.**—Range, 125; system, Marconi, 120; hours, N.
- ANTILLES.**—System, Marconi, 120.
- APACHE (KVÁ).**—System, Marconi, 250.
- ARAPAHOE.**—System, Marconi, 400.
- ARGYLL (WTB).**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Note, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.

- ARIZONA.**—Range, 150; system, Marconi, 120; hours, X.
- ARIZONAN.**—Range, 350; system, Telefunken, 1000; hours, 9m-12m, 2s-5s, 8s-10.30s; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- AROLINE.**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- ASHTABULA.**—Range, 125; system, Marconi, 240.
- ASTRAL.**—Note, Standard Oil Co. of New York, owner of vessel.
- ASUNCION (WTX).**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram. Note, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.
- ATENAS.**—Range, 500; system, composite, 1000; hours, N; rates, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- ATLANTIC.**—Range, 200; system, Marconi, 240; hours, X.
- ATLAS (WTT).**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram. Note, Standard Oil Co. of California, owner of vessel.
- AZTEC.**—System, Marconi, 240; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- BAY STATE.**—Range, 300.
- BEAR (WWD).**—System, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- BEAVER (WWB).**—Range, 200; system, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- BELFAST.**—Range, 200; system, Marconi, 120.
- BERKSHIRE.**—System, Marconi-United, 240.
- BERLIN (WRB).**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Note, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.
- BORINQUEN.**—Strike out system. Strike out notes.
- BRAZOS.**—System, Marconi, 240.
- BREAKWATER.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Note, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.
- BRILLIANT (KTI).**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of New York, owner of vessel.
- BRINDILLA.**—Note, Standard Oil Co. of New Jersey, owner of vessel.
- BRUNSWICK.**—System, Marconi, 240.
- BUFFALO (NBU).**—Call, NCU.
- CABRILLO.**—Range, 150; system, Marconi, 120; hours, X; rates, San Pedro-Avalon ferry service, 1 c. (0.05 fr.) per word, 10 c. (0.50 fr.), minimum, per radiogram.
- CALIFORNIA (KYQ).**—Note, Mrs. Clara B. Stocker, owner of vessel (yacht).
- CALVIN AUSTIN.**—Range, 200; system, Marconi, 120.
- CAMDEN.**—Range, 200; system, Marconi, 120.
- CAMINO.**—System, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- CAPTAIN A. F. LUCAS.**—Range, 200; system, Marconi, 120; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- CARACAS.**—System, Marconi, 120.
- CARLOS.**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- CAROLINA (WFE).**—Range, 150; system, Marconi, 120; hours, N; rates, 2 c. (0.10 fr.) per word, 20 c. (1 fr.), minimum, per radiogram.
- CARTAGO.**—Range, 500; system, Wireless Specialty Apparatus Co., 1000; hours, N; rates, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.

CATANIA.—Strike out all particulars.

CELLO.—System, Marconi, 120; service, PG; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.

CENTRALIA.—System, Marconi, 120; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.

CHALMETTE.—System, Marconi, 400.

CHEROKEE.—System, Marconi, 400.

CHICAGO (WAC).—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Note, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.

CHICAGO (WFI).—Range, 150; system, Marconi, 120; W. L., 300, 600; service, PG; hours, N; rates, 2 c. (0.10 fr.) per word, 20 c. (1 fr.), minimum, per radiogram. Note, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.

CHINA (WWA).—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.

CHRISTOPHER COLUMBUS.—Range, 150; system, Marconi, 120; hours, N; rates, 2 c. (0.10 fr.) per word, 20 c. (1 fr.), minimum, per radiogram.

COAMO.—System, Marconi, 400.

COL. E. L. DRAKE.—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of California, owner of vessel.

COL. JAMES M. SCHOONMAKER.—Range, 150; system, Marconi, 120.

COLON.—System, Telefunken, 1000; W. L., 300, 450, 600.

COLUMBIA (KYM).—System, Telefunken, 1000.

COLUMBIA (WHC).—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.

COLUMBIAN (WKS).—Range, 200; system, Telefunken, 1000; hours, 9m-12m, 2s-5s, 8s-10.30s, rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.

COMAL.—System, Marconi, 400.

COMANCHE.—System, Marconi, 400.

COMET (KTJ).—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of New York, owner of vessel.

COMUS (KKD).—System, Marconi, 120.

CONCHO.—System, Marconi, 120.

CONGRESS.—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.

COPPENNAME.—Range, 350; system, Wireless Specialty Apparatus Co., 1000; hours, N; rates, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.

CORDOVA.—System, Marconi, 120; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.

CORONADO.—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Coronado Co., owner of vessel.

CREOLE.—System, Marconi, 400.

CRETAN.—System, Marconi-United, 120.

CRISTOBAL.—Range, 300; system, Telefunken, 1000; W. L., 300, 450, 600.

CYPRUS.—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Daniel C. Jackling, owner of vessel (yacht).

CITY OF ALPENA II.—Range, 125; system, Marconi, 120; hours, X.

CITY OF ANNAPOLIS.—Strike out all particulars.

CITY OF AUGUSTA.—System, Marconi, 120.

CITY OF BALTIMORE.—Strike out all particulars.

CITY OF BANGOR.—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG; hours, X; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Eastern Steamship Corporation, owner of vessel.

- CITY OF BENTON HARBOR.**—Range, 150; system, Marconi, 120; hours, N; rates, 2 c. (0.10 fr.) per word, 20 c. (1 fr.), minimum, per radiogram.
- CITY OF BUFFALO.**—Range, 100; system, Marconi, 120.
- CITY OF CHICAGO.**—Range, 125; system, Marconi, 120; hours, N; rates, 2 c. (0.10 fr.) per word, 20 c. (1 fr.), minimum, per radiogram.
- CITY OF CLEVELAND III.**—Range, 125; system, Marconi, 240. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Detroit & Cleveland Navigation Co., owner of vessel.
- CITY OF COLUMBUS.**—System, Marconi, 240.
- CITY OF DETROIT II.**—Range, 125; system, Marconi-United, 120.
- CITY OF DETROIT III.**—Range, 125; system, Marconi, 120.
- CITY OF ERIE.**—System, Marconi, 240; hours, X.
- CITY OF EVERETT.**—Note, Standard Oil Co. of New York, owner of vessel.
- CITY OF GRAND RAPIDS.**—Range, 125; system, Marconi, 120; hours, N; rates, 2 c. (0.10 fr.) per word, 20 c. (1 fr.), minimum, per radiogram.
- CITY OF MACKINAC II.**—Range, 125; system, Marconi, 120; hours, X.
- CITY OF MONTGOMERY.**—System, Marconi, 120.
- CITY OF NORFOLK.**—Strike out all particulars.
- CITY OF PARA.**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- CITY OF PUEBLA.**—System, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- CITY OF RICHMOND.**—Strike out all particulars.
- CITY OF ROCKLAND.**—Range, 200; system, Marconi, 120.
- CITY OF St. IGNACE.**—Range, 125; system, Marconi, 120; hours, X.
- CITY OF St. LOUIS.**—System, Marconi, 400.
- CITY OF SAVANNAH.**—System, Marconi, 400.
- CITY OF SEATTLE.**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- CITY OF SYDNEY.**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- CITY OF TOPEKA.**—System, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.), per word, 80 c. (4 fr.), minimum, per radiogram.
- DAKOTAN.**—System, Marconi, 480.
- DAMARA.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Edgar F. Luckenbach, owner of vessel.
- DELAWARE SUN.**—Range, 250; system, Marconi, 120; hours, 8m-12m; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- DELHI.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- DENVER (KED).**—System, Marconi, 120.
- DOLPHIN (WAU).**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- DORA.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Alaska Steamship Co., owner of vessel.
- DORCHESTER.**—Range, 200; system, Marconi-United, 120.
- DOROTHY BRADFORD.**—Range, 200.
- EASTERN STATES.**—Range, 125; system, Marconi, 240.
- EASTLAND.**—Range, 100; system, Marconi-United, 120.
- EDGAR H. VANCE.**—Range, 150; system, Marconi, 1000; W. L., 300, 600; service, PG; hours, X; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Hammond Lumber Co., owner of vessel.
- EL ALBA.**—System, Marconi, 480; hours, N.
- EL CID.**—System, Marconi, 120.
- EL DIA.**—System, Marconi, 120; hours, X.
- EL MUNDO.**—System, Marconi, 120.
- EL OCCIDENTE.**—System, Marconi, 400.
- EL ORIENTE.**—System, Marconi, 400.
- EL RIO.**—System, Marconi, 400.

- EL SEGUNDO.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of California, owner of vessel.
- EL SIGLO.**—System, Marconi, 120.
- EL SOL.**—System, Marconi, 400.
- EL SUD.**—System, Marconi, 1000.
- ENTERPRISE.**—System, Marconi, 240; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- Eocene.**—Note, Radio station operated and controlled by the Standard Oil Co. of New York, owner of vessel.
- ERSKINE M. PHELPS.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. William D. Sewall (Union Oil Co.), owner of vessel.
- ESPERANZA.**—System, Marconi, 120.
- ESSEX (KQE).**—System, Marconi-United, 120.
- EXCELSIOR (KKO).**—System, Marconi, 400.
- F. A. KILBURN.**—Range, 150; system, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- FALCON (WRK).**—System, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- FAVORITE.**—Range, 100; system, Marconi, 120; hours, X; rates, 2 c. (0.10 fr.) per word, 20 c. (1 fr.), minimum, per radiogram.
- FIFIELD.**—System, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- FLORIDA (KSY).**—Strike out all particulars.
- FLORIDA (KUS).**—Range, 150; system, Marconi, 240; W. L., 300, 600; service, PG; hours, X; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- FRANK H. BUCK.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Associated Oil Co., owner of vessel.
- FRIEDA.**—System, Marconi, 480; hours, X.
- GENERAL HUBBARD.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Hubbard Steamship Co., owner of vessel.
- GENL. PETTIBONE.**—Note, Guyton & Co., owner of vessel.
- GEO. W. ELDER.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. North Pacific Steamship Co., owner of vessel.
- GEORGE W. FENWICK.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Fenwick Steamship Co. (California & Atlantic Steamship Co.), owner of vessel.
- GEORGIAN (WKG).**—Range, 200; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- GLORY OF THE SEAS.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Glacier Fisheries Co., owner of vessel.
- GLOUCESTER (KQG).**—System, Marconi-United, 120.
- GOVERNOR.**—System, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- GOVERNOR COBB.**—Range, 200; system, Marconi, 120.
- GOVERNOR DINGLEY.**—Range, 200; system, Marconi, 120; hours, N; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- GRACE DOLLAR.**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.

- GRECIAN.**—Range, 150; system, Marconi, 240.
- GUARDIAN.**—Range, 200; system, Marconi, 240; hours, N; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- GULFOIL.**—Range, 200; system, Marconi, 240; hours, various from 6m-9s; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- GULFSTREAM.**—Range, 250; system, Marconi, 240; hours, 8m-12m; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- HAMILTON.**—System, Marconi, 140.
- HANALEI.**—Strike out all particulars.
- HARVARD.**—System, Poulsen arc. Strike out Rates. Notes, Radio station operated and controlled by the Federal Telegraph Co. Metropolitan Steamship Co. (Pacific Steam Navigation Co.), owner of vessel.
- HAVANA.**—System, Marconi, 120.
- HENRY M. FLAGLER.**—Range, 100; system, Marconi, 240; service, PG; hours, X; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Florida East Coast Railway Co., owner of vessel.
- HENRY T. SCOTT.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. California Steamship Co., owner of vessel.
- HEREDIA.**—Range, 500; system, composite, 1000; hours, N; rates, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- HILONIAN.**—Range, 200; system, Marconi, 120; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- HOLLAND (WDW).**—Range, 150; system, Marconi, 120; hours, N; rates, 2 c. (0.10 fr.) per word, 20 c. (1 fr.), minimum, per radiogram.
- HONOLULU.**—Range, 250; system, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- HOWARD.**—System, Marconi-United, 120.
- HUMBOLDT.**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- HURON.**—System, Marconi, 400.
- HYADES.**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Matson Navigation Co., owner of vessel.
- IAQUA.**—System, Marconi, 230; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- ILLINOIS (WCZ).**—Range, 150; system, Marconi, 120.
- INDEPENDENT.**—System, Marconi; W. L., 300, 600; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Weiding & Independent Fisheries Co., owner of vessel.
- INDIAN (KQI).**—Range, 150; system, Marconi-United, 120.
- INDIANA (WFC).**—Range, 150; system, Marconi, 120.
- IOWA (WFD).**—Range, 150; system, Marconi, 120.
- IOWAN.**—Range, 250; system, Telefunken, 1000.
- IROQUOIS (KVF).**—Range, 200; system, Marconi, 400; W. L., 300, 600; service, PG; hours, N; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Clyde Steamship Co., owner of vessel.
- ISTHMIAN.**—Range, 200; system, Telefunken, 1000; hours, 9m-12m, 2s-6s, 8s-10.30s; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- J. A. CHANSLOR.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Associated Oil Co., owner of vessel.
- JAMESTOWN.**—System, Marconi, 120.
- J. B. STETSON.**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- JEFFERSON (KOD).**—System, Marconi, 120.

- JEFFERSON (WAJ).**—System, Marconi, 120; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- J. M. GUFFEY.**—Range, 200; system, Marconi, 120; hours, various from 6m-9s; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- JOHN A. HOOPER.**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- JOHN D. ARCHBOLD.**—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of New York, owner of vessel.
- JOHN D. ROCKEFELLER.**—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of New Jersey, owner of vessel.
- JUNIATA (KQJ).**—System, Marconi-United, 120.
- KERSHAW.**—System, Marconi-United, 120.
- KLAMATH.**—System, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- KOREA.**—Range, 250; system, Marconi, 240; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- LAKEPORT.**—Range, 100; system, Marconi, 240; W. L., 300, 600; service, PG; hours, X; rates, 2 c. (10 fr.), per word, 20 c. (1 fr.), minimum, per radiogram.
- LAMPASAS.**—System, Marconi, 120.
- LANSING.**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- LARIMER.**—Range, 200; system, Marconi, 120; hours, various from 6m-9s; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- LATOUCHE.**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- LEELANAW.**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- LEWIS LUCKENBACH.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Edgar F. Luckenbach (California & Atlantic Steamship Co.), owner of vessel.
- LEXINGTON (KNB).**—System, Fessenden, 260.
- LEXINGTON (KQL).**—Range, 150; system, Marconi-United, 240.
- LOUISE.**—Range, 75; system, Marconi-United, 120; W. L., 300, 600; service, PG; hours, 9m-11s. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Tolchester Beach Improvement Co., owner of vessel.
- LOUISIANA (KUL).**—Range, 200; system, Marconi, 240; hours, X; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- LURLINE.**—Range, 200; system, Marconi, 240; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- LYRA (WNF).**—Range, 200; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- MACINAW.**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- MADISON.**—System, Marconi, 120.
- MANCHURIA.**—Range, 250; system, Marconi, 240; hours, N; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- MANITOU (WFW).**—Range, 150; system, Marconi, 120.
- MANOA.**—Range, 200; system, Marconi, 240; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- MARACAIBO.**—System, Marconi, 120.
- MARIPOSA.**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.

- MAROWLINE.**—Range, 350; system, Wireless Specialty Apparatus Co., 1000; hours, N; rates, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- MARQUETTE & BESSEMER No. 1.**—Range, 125; system, Marconi, 240.
- MARQUETTE & BESSEMER No. 2.**—Range, 125; system, Marconi, 240; hours, X.
- MASSACHUSETTS (KJM).**—Range, 200; system, Marconi, 120; hours, N; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Eastern Steamship Corporation, owner of vessel.
- MATSONIA.**—Range, 200; hours, N; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- MAVERICK.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of California, owner of vessel.
- MERRIMACK.**—System, Marconi-United, 120.
- MEXICAN.**—Range, 350; system, Telefunken, 1000; hours, 9m-12m, 2s-5s, 8s-10.30s; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- MEXICO (KWX).**—System, Marconi, 400.
- MILLINOCKET.**—System, Marconi, 120. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. A. H. Bull Steamship Co., owner of vessel.
- MINNESOTA (WEK).**—Range, 150; system, Marconi, 120; hours, N; rates, 2 c. (0.10 fr.) per word, 20 c. (1 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Lake Michigan Steamship Co., owner of vessel.
- MINNESOTA (WMI).**—Rate, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- MINNESOTAN.**—System, Marconi, 1000.
- MISSOURI (WFX).**—Range, 125; system, Marconi, 120; hours, N; rates, 2 c. (0.10 fr.) per word, 20 c. (1 fr.), minimum, per radiogram.
- MOHAWK (KVM).**—System, Marconi, 400.
- MOHAWK (NRM).**—Call in United States list should be NRM instead of NVM.
- MOHEGAN.**—System, Fexenden, 250.
- MOMUS.**—System, Marconi, 120.
- MONGOLIA.**—Range, 250; system, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- MONTEREY (KWY).**—System, Marconi, 400.
- MORRO CASTLE.**—System, Marconi, 120.
- MULTNOMAH.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Multnomah Steamship Co., owner of vessel.
- NACOOCHEE.**—System, Marconi, 120.
- NANN SMITH.**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- NANTUCKET.**—System, Marconi-United, 120.
- NAVADA (WNJ).**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Western Steam Navigation Co. (California & Atlantic Steamship Co.), owner of vessel.
- NEBRASKAN.**—System, Telefunken, 1000; hours, 9m-12m, 2s-5s, 8s-10.30s.
- NELSON.**—Range, 200; system, Marconi, 480.
- NEMO.**—Range, 20; system, Wireless Improvement Co., 1000; hours, X. Notes, Radio station operated and controlled by Emil J. Simon. M. N. Liebmann, owner of vessel.
- NEVADAN.**—Range, 200; system, Telefunken, 1000; hours, 9m-12 m, 2s-5s, 8s-10.30s; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- NEWPORT (WWH).**—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- NOME CITY.**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.

- NORTH AMERICAN.—Range, 150; system, Marconi, 480.
- NORTHLAND (WNX).—System, Marconi, rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. E. J. Dodge & Co., owner of vessel.
- NORTH LAND (WCN).—System, Marconi, 120.
- NORTH LAND (KJD).—System, Marconi, 120.
- NORTH STAR (KJS).—System, Marconi, 120.
- NORTH WESTERN.—System, Marconi, 120.
- NORTH WIND.—System, Telefunken, 120.
- NORWOOD.—System, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- NUECES.—System, Marconi, 120.
- NEW HAVEN (KXN).—System, Fessenden, 260.
- NEW JERSEY (KNJ).—Strike out all particulars.
- OCEANA.—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Bermuda-American Steamship Co., owner of vessel.
- OCTORARA.—System, Marconi, 120.
- OLEUM.—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Fillmore Condit (Union Oil Co.), owner of vessel.
- OLIVER J. OLSON.—Range, 200; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- OLIVETTE.—Range, 200; system, Marconi, 400.
- ONEONTA.—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Port of Portland, owner of vessel.
- ONTARIO.—System, Marconi-United, 120.
- PAMPANGA.—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- PANAMA (KMH).—Range, 300; system, Telefunken, 1000; W. L., 300, 450, 600.
- PAN-AMERICAN.—Range, 150; system, Marconi, 400; W. L., 300, 600; service, PG; hours, X; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Texas Steamship Co., owner of vessel.
- PARAGUAY.—Range, 150; system, Marconi-United, 120; W. L., 300, 600; service, PG.
- PARAISO.—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- PARISMINA.—Range, 500; system, composite, 1000; service, PG; hours, N; rates, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Tropical Radio Telegraph Co. Parismina Steamship Corporation, owner of vessel.
- PARTHIAN.—Range, 150; system, Marconi-United, 120.
- PENNSYLVANIA (WWI).—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- PERE MARQUETTE.—Range, 100; system, Marconi, 120; hours, N.
- PERE MARQUETTE 17.—System, Marconi, 120; hours, N.
- PERE MARQUETTE 18.—Range, 125; system, Marconi, 120.
- PERE MARQUETTE 19.—System, Marconi, 120; hours, N.
- PERE MARQUETTE 20.—Range, 125; system, Marconi, 120; W. L., 300, 600.
- PERFECTION.—System, Marconi; W. L., 300, 600; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Note, Standard Oil Co. of New York, owner of vessel.
- PERSIAN.—System, Marconi-United, 120.
- PERU (WWJ).—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- PHILADELPHIA (KDA).—System, Marconi, 400.
- PHILADELPHIA (KSM).—Range, 200; system, Marconi, 240.
- PLEIADES.—Range, 200; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- PLYMOUTH.—System, Fessenden, 260.
- PONCE.—System, Marconi, 400.
- PORTLAND.—Range, 200; system, Marconi, 240; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.

- POWHATAN (KQY).**—System, Marconi-United, 120.
- PRESIDENT.**—Range, 200; system, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- PRINCESS ANNE.**—System, Marconi, 120.
- PROTEUS (KKP).**—System, Marconi, 120.
- PROTEUS (NNG).**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- PROVIDENCE.**—System, Fessenden, 260.
- PURITAN (WDU).**—Range, 150; system, Marconi, 120.
- QUEEN (WGX).**—System, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- RADIANT.**—System, Marconi; strike out service and hours; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of New York, owner of vessel.
- RAYO.**—Note, Standard Oil Co. of New York, owner of vessel.
- REDONDO.**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- RELAY.**—Range, 200; system, Marconi, 240; service, P; hours, N.
- RELIEF LIGHTSHIP 66 OR 85.**—Service, PG; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- RELIEF LIGHTSHIP 71 OR 72.**—Service, PG; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- RELIEF LIGHTSHIP 94 OR 53.**—Service, PG; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- REUCE.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Columbia River Packers' Association, owner of vessel.
- RICHMOND.**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of California, owner of vessel.
- RIO GRANDE (KEG).**—System, Marconi, 400.
- ROANOKE.**—System, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- ROMA (WTE).**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Union Steamship Co. (Union Oil Co.), owner of vessel.
- ROSE CITY.**—Range, 200; system Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- SABINE.**—System, Marconi, 400.
- SAN JACINTO.**—System, Marconi, 460.
- SAN JOSE.**—Range, 200; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.), minimum, per radiogram.
- SAN JUAN (KGJ).**—System, Marconi, 120.
- SAN JUAN (WWM).**—Range, 200; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- SAN MARCOS.**—System, Marconi, 120.
- SAN RAMON.**—System, Marconi, 240; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- SANTA ANA.**—Rate, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Alaska Steamship Co., owner of vessel.
- SANTA CATALINA.**—Strike out all particulars.
- SANTA CECILIA.**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- SANTA CLARA (WBA).**—Range, 200; system, Marconi, 240; hours, N; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- SANTA CLARA (WRS).**—System, Marconi, 120; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.

- SANTA CRUZ (WBD).**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Atlantic & Pacific Steamship Co., owner of vessel.
- SANTA MARIA (WTF).**—Range, 200; system, Marconi, 120; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- SANTA RITA (WTG).**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. United Steamship Co. (Union Oil Co.), owner of vessel.
- SANTANTA.**—Range, 30; system, Clapp-Eastham, 900; service, P; hours, X.
- SARATOGA (KWS).**—System, Marconi, 120.
- SATELLITE (KPS).**—Range, 30; system, composite, 120; service, PG; hours, X; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Note, Radio station operated and controlled by Alfred S. Sorenson & Sons, owners of vessel.
- SEANDBEE.**—Range, 150; system, Marconi, 120.
- SEGURANCA.**—System, Marconi, 400. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. New York & Cuba Mail Steamship Co. (Ward Line), owner of vessel.
- SEMINOLE (KVJ).**—System, Marconi, 120.
- SENATOR.**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- SENATOR BAILEY.**—Strike out all particulars.
- SEWARD.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Alaska Steamship Co., owner of vessel.
- SHENANGO (KTC).**—Range, 150; system, Marconi, 120; hours, various from 6m–9s; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- SHENANGO (WET).**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- SIBERIA.**—Range, 250; system, Marconi, 240; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- SIERRA.**—Strike out range, system, and rates. Note, Oceanic Steamship Co., owner of vessel.
- SOCONY.**—Note, Standard Oil Co. of New York, owner of vessel.
- SOMERSET (KQS).**—System, Marconi-United, 120.
- SONOMA (WHM).**—Range, 250; system, Marconi, 240; rates, North and South American service, 4 c. (0.20 fr.) per word, 40c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- SOUTH AMERICAN (KVV).**—Range, 150; system, Marconi, 240; hours, X; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- SOUTH AMERICAN (WEO).**—Range, 125; system, Marconi, 120; hours, N; rates, 2 c. (0.10 fr.) per word, 20 c. (1 fr.), minimum, per radiogram.
- SPEEDWELL.**—Range, 100; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- SPOKANE.**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- S. O. Co. No. 91.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of California, owner of vessel.
- S. O. Co. No. 92.**—Note, Standard Oil Co. of New York, owner of vessel.
- S. O. Co. No. 93.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of California, owner of vessel.
- S. O. Co. No. 94.**—Note, Standard Oil Co. of New York, owner of vessel.
- S. O. Co. No. 95.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of California, owner of vessel.
- STANLEY DOLLAR.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Dollar Steamship Line, owners of vessel.

- STARR.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. San Juan Fishing & Packing Co., owner of vessel.
- STATE OF OHIO.**—Range, 100; system, Marconi-United, 120. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Cleveland & Buffalo Transit Co., owner of vessel.
- SUN.**—Range, 250; system, Marconi, 240; hours, 8m-12m.
- SUWANNEE.**—System, Marconi-United, 120.
- ST. FRANCIS.**—System, Marconi; rates 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Libby, McNeill & Libby, owners of vessel.
- ST. HELENS.**—Rates, North and South American service 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- ST. NICHOLAS.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Columbia River Packers' Association, owner of vessel.
- TAHOMA.**—Strike out all particulars.
- TASCO.**—System, Fessenden, 250; service, PG; hours, X; rates, 3 c. (0.15 fr.) per word, 30 c. (1.50 fr.), minimum, per radiogram.
- TEXAS (KUR).**—Range, 200; system, Marconi, 240; hours, X; rates 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- THEODORE ROOSEVELT.**—Range, 150; system, Marconi, 120; hours, N; rates, 2 c. (0.10 fr.) per word, 20 c. (1 fr.), minimum, per radiogram.
- TRONESTA.**—System, Marconi, 120.
- TIVIVES.**—Range, 500; system, composite, 1000; hours, N; service PG; rates, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- TOLEDO.**—Range, 200; system, Marconi, 120; W. L., 300, 600; service, PG; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Sun Co., owner of vessel.
- TOPILA.**—Hours, 7m-12m, 1s-5s, 7s-10s.
- TURRIALBA.**—Range, 500; system, Wireless Specialty Apparatus Co., 1000; service, PG; hours, N. Notes, Radio station operated and controlled by the Tropical Radio Telegraph Co. Turrialba Steamship Corporation, owner of vessel.
- TUSCAN.**—Range, 150; system, Marconi-United, 120; hours, 8m-8s.
- UMATILLA.**—System, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- VANADIS.**—Range, 300; system, Telefunken, 1000; W. L., 300, 450, 600; service, P; hours, X. Note, Radio station operated and controlled by C. K. G. Billings, owner of vessel (yacht).
- VENTURA.**—Range, 200; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- VESTA (KTS).**—System, Marconi; W. L., 300, 600; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of New York, owner of vessel.
- VESTAL.**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- VICTORIA (WAD).**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- VIGILANCIA.**—System, Marconi, 400.
- VIRGINIA (KSZ).**—Strike out all particulars.
- VIRGINIAN (WKV).**—Range, 350; system, Telefunken, 1000; hours, 9m-12m, 2s-5s, 8s-10.30s; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- WALLULA.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Port of Portland, owner of vessel.
- WASHINGTONIAN.**—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. American-Hawaiian Steamship Co., owner of vessel.
- WASHTENAW.**—Range, 200; system, Marconi, 120; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.

RADIO SERVICE BULLETIN.

- W. B. FLINT.—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Libby, McNeill & Libby, owners of vessel.
- WESTERN STATES.—Range, 125; system, Marconi, 240; hours, X.
- WHITTIER.—Range, 200; system, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- WILHELMINA.—Range, 250; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- WILLAMETTE.—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Willamette Steamship Co., owner of vessel.
- WILLIAM CHATHAM.—System, Marconi, 120; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- WM. F. HERRIN.—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- WILLIAM P. SNYDER JR.—Range, 125; system, Marconi, 120.
- WINDBER.—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Pacific-American Fisheries, owner of vessel.
- WINIFRED.—Range, 200; system, Marconi, 120; hours, 7m-9s; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram.
- W. S. PORTER.—Rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Associated Oil Co., owner of vessel.
- YAGUEZ.—Strike out range and system. Note, Ocean Freight Line (Inc.), owner of vessel.
- YALE.—System, Poulsen arc. Strike out rates. Notes, Radio station operated and controlled by the Federal Telegraph Co. Metropolitan Steamship Co. (Pacific Steam Navigation Co.), owner of vessel.
- YOSEMITE.—System, Marconi, 120; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- YUCATAN.—Range, 200; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram.
- ZACAPA.—Range, 500; system, composite, 1000; service, PG; hours, N; rates, 8 c. (0.40 fr.) per word, 80 c. (4 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Tropical Radio Telegraph Co. Zacapa Steamship Corporation, owner of vessel.
- ZAPORA.—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.), minimum, per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. International Fisheries Co., owner of vessel.
- ZULIA.—System, Marconi, 240.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out particulars after the following call signals: KGS, KNJ, KRY, KRZ, KSV, KSW, KSX, KSY, KSZ, NRK, WAS, WBC, WHN, WTI.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made in the list of Radio Stations of the United States only.]

- GRAND FORKS, N. DAK.—Call, 9XN; W. L., 300-1400*.
- HYATTSVILLE, MD.—W. L., 300, 400, 600*.
- NEW BEDFORD, MASS.—W. L., 200, 300, 425, 600.
- OAKLAND, CAL.—Strike out all particulars.
- PHILADELPHIA, PA.—W. L., 300, 500, 600.
- ST. DAVIDS, PA.—W. L., 300, 425, 450, 600.

SPECIAL LAND STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out 6YE, and change 9YN to 9XN.

MISCELLANEOUS.

SOUTH WELLFLEET STATION.

The license issued to the Marconi Wireless Telegraph Co. of America for their high-powered station at South Wellfleet, Mass., has been amended, authorizing a coast-station rate of 42 cents per word on radiograms transmitted to vessels at sea, distant 400 miles or more. This rate, plus an 8-cent ship-station charge, makes a total wireless rate of 50 cents per word, to which the land line charges must be added.

CLASSIFICATION OF SHIP STATIONS.

There seems to be some misunderstanding concerning the classification of ship stations, as provided in the Laws and Regulations, edition of July 27, 1914, page 51.

If a vessel volunteers to enter a class higher than required by the regulations, and is so licensed, the vessel is required to maintain the service or watch prescribed. The license is a guaranty to the public for the class of service designated therein. Vessels violating classification requirements indicated by their licenses may be penalized under section 1 of the act of August 13, 1912, as any station operating in violation of the provisions of its license is held to be operating for a purpose other than that for which it was licensed.

If a vessel of the first class finds it impossible at any time to obtain two first-grade operators, it would constitute a violation for a second-grade operator to serve, but any mitigating circumstances may be presented to the Secretary of Commerce.

The London convention provides that ship-service messages or messages of the crew may be transmitted by a second-grade operator, but contemplates that all regular paid passenger traffic be handled by first-grade operators at not less than 20 words per minute.

GASOLINE ENGINES.

Attention is invited to the act of Congress, approved October 22, 1914, effective on and after date of approval, amending section 4472, Revised Statutes, and which reads as follows:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section forty-four hundred and seventy-two of the Revised Statutes of the United States of America be, and the same is hereby, amended by adding thereto the following provision:

"Provided, however, That nothing in the foregoing or following section of this Act shall prohibit the transportation and use by vessels carrying passengers or freight for hire of gasoline or any of the products of petroleum for the operation of engines to supply an auxiliary lighting and wireless system independent of the vessel's main power plant: *Provided further,* That the transportation or use of such gasoline or any of the products of petroleum shall be under such regulations as shall be prescribed by the board of supervising inspectors, with the approval of the Secretary of Commerce."

In the near future regulations authorized by the last proviso of the amendment will be adopted by an executive committee of the Board of Supervising Inspectors of Steam Vessels. When these regulations are approved they will be published in this bulletin as an amendment to the Radio Laws and Regulations, edition of July 27, 1914, page 49, paragraph 8.

If an internal-combustion engine is provided as the only means of auxiliary power supply to operate the radio equipment, under the act of June 24, 1910, amended July 23, 1912, it will be necessary for radio inspectors to determine if the equipment is efficient under the ship act, and in accordance with the regulations governing radio communication, page 49, paragraphs 1 to 5, inclusive.

Until such regulations are approved, gasoline may not be carried except with the approval of the Secretary of Commerce in each case, and then subject to change to meet such requirements as may be later promulgated.

INTERFERENCE.

The twelfth and thirteenth regulations, section 4, of the radio act, approved August 13, 1912, provide for a division of time between Government and commercial radio stations when interference between such stations can not be eliminated by the enforcement of the wave length and sharp tuning regulations.

In some localities where two or more commercial land stations are operated in close proximity, the various owners have mutually agreed upon a division of time.

In particular, complaints have been entered against the Federal Telegraph Co. for interference on general public service and Government wave lengths, caused by their Poulsen arc stations at San Francisco and Honolulu.

F. A. Kolster, radio expert of the Bureau of Standards, was sent to San Francisco to determine the cause of the interference and remedy it if possible. The details of his investigations will be published in an early edition of the Proceedings of the Institute of Radio Engineers. The conclusions reached by Mr. Kolster indicate that the interference caused by the arc stations is due to certain reinforced harmonics, which, in extreme cases, can be eliminated or reduced by the employment of special circuits at either the sending or receiving stations, or both. It appears, however, in the particular cases reported and investigated, that the interference can be sufficiently reduced or eliminated at the receiving station by proper manipulation of modern efficient receiving apparatus.

Operators should bear in mind the following:

First. Interference of this character can be reduced and often entirely eliminated by proper adjustment of the coupling of the receiving transformer. In most cases a fairly "loose coupling" will be required.

Second. Variation of coupling destroys resonance and thereby reduces the strength of the desired incoming signals unless the circuits are readjusted to resonance for each variation of coupling.

COMMERCIAL EXTRA FIRST-GRADE OPERATORS.

As a reward for long and efficient service, the Secretary of Commerce has issued commercial extra first-grade licenses to the following operators:

E. N. Pickerill, New York, N. Y.
H. Sadenwater, New York, N. Y.
R. R. Carlisle, San Francisco, Cal.
D. I. Moir, Seattle, Wash.
H. B. Herty, New Orleans, La.
E. M. Cadwell, New York, N. Y.
S. E. Miller, San Francisco, Cal.

C. A. Scott, Boston, Mass.
J. A. Worrall, New York, N. Y.
E. K. Oxner, Boston, Mass.
J. W. Swanson, New York, N. Y.
A. E. Gerhard, San Francisco, Cal.
G. A. Geare, Washington, D. C.

RADIO SERVICE PERSONNEL.

R. E. Thompson, radio inspector at Seattle, resigned January 1, 1915, and R. H. Marriott, one of the radio inspectors at New York, has been transferred to Seattle.

W. O. Hensgen, one of the radio inspectors at New York, resigned January 1, 1915, and C. C. Kolster, assistant radio inspector, has been detailed to New York.

PANAMA-PACIFIC INTERNATIONAL EXPOSITION.

The Bureau of Standards and the Bureau of Navigation will have a joint radio exhibit at the Panama-Pacific International Exposition. The exhibit will be located in the Liberal Arts Building.

The one-quarter kilowatt, quenched spark gap, battery operated panel set, designed by the Bureau of Standards, which did such good work on the Department's motor boat *Tarragon* last summer on the Atlantic coast, will be exhibited and demonstrated. A complete set of inspection instruments used by the radio inspectors in the enforcement of the wireless laws will be included in the exhibit and the method of inspection will be explained and demonstrated frequently. Several other features of interest to those concerned with radiotelegraphy will be exhibited and demonstrated by the Bureau of Standards.

Benjamin E. Wolf, radio inspector of the Bureau of Navigation, has been appointed special agent in charge of the Bureau of Navigation exhibit. A radio inspector will be in constant attendance and will be prepared to give information concerning the radio laws and regulations to owners and masters of vessels, operators, and amateurs. Examinations of operators for Government licenses will be conducted at the exhibit by appointment.

OPERATOR EXAMINATIONS.

The Army Service School at Fort Leavenworth, Kans., has been added to the list of places where operators may take examination for licenses.

RADIO RATES INCREASED.

The Marconi Wireless Telegraph Co. of America has been authorized to increase the Pacific coast radio rates of their ship and shore stations for the North and South American service, as follows: Ship rate from 2 cents to 4 cents per word; coastal rate from 3 cents to 6 cents per word.

This makes uniform rates for this Marconi service on both the Atlantic and Pacific coasts, and conforms to the rates of the United States Naval Radio Service.

AMATEUR FINED.

A. W. Eaton, of Los Angeles, Cal., who operated his amateur station without a license, was reported by the radio inspector of that district, and was found guilty and fined on November 24, 1914, by Judge Wellborn, of the United States district court.

This case is interesting because the defendant contended that his station did not require a license, inasmuch as he could not interfere with commercial stations in the vicinity or transmit beyond the limits of the State in which his station was located. His conviction was obtained on the ground that he could interfere with the interception of signals from outside that State by licensed amateurs, and establishes a precedent in this regard.

AMENDMENTS.

[To be cut out and pasted in your copy.]

The Radio Communication Laws of the United States, edition of July 27, 1914, are hereby amended as follows:

Paragraph 153, page 66, add the following sentence:

Renewals or new licenses may be issued a reasonable length of time previous to the expiration of existing licenses, but must bear the exact date of issue, which must correspond with the date on the back of Form 756 forwarded to the Commissioner of Navigation.

Paragraph 162, page 67, should read:

Operators desiring to retain their expired or canceled licenses may make application therefor to the examining officer or to the Commissioner of Navigation. Old licenses returned to operators will be marked "Canceled" or "Expired" in red across their faces, and the service record will be transcribed on the back of Form 756 sent to the Commissioner of Navigation, in accordance with paragraph 154, above.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, February, 1915—No. 2

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instructions, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the list of Radio Stations of the United States, and will contain information concerning Government, commercial, and special stations only. Information regarding amateur stations will appear only in the annual edition of the list of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the list of Radio Stations of the United States and the list of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) will be printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws will be printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
E. F. SWEET,
Acting Secretary.

ABBREVIATIONS.

INTERNATIONAL ABBREVIATIONS USED IN THIS LIST.

Nature of service:

- PG=General public.
 PR=Limited public or limited commercial.
 P=Private.
 O=Government business exclusively.

Hours of operation:

- N=Continuous service.
 X=No regular hours.
 m=a. m.
 s=p. m.
 12 m=Midday.
 12 s=Midnight.
 fr.=Franc (francs).
 c.=Cents.

OTHER ABBREVIATIONS.

- Name =Name of station.
 G. loc. =Geographical location (O=west longitude, N=north latitude).
 Call =Radio call letters.
 System=Radio system used and sparks per second.
 Range =Normal range in nautical miles.
 W. L. =Wave lengths.
 Service=Nature of service.
 Hours =Hours of operation.
 Rates =Ship or coast charges in francs and dollars.
 Notes =Refers to notes in the Berne list.
 Co. =Company.
 Corp. =Corporation.

NEW STATIONS.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the list of radio stations of the United States, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name.	Call signal.	System.	Wave lengths.	Ship rate.	
				Per word.	Minimum per radiogram.
Bradford ¹	KNG	.....	300,600	.....	.....
California (WOR) ²	WOR	.....	300,600	.....	.....
Camaguey ³	KWI	.....	300,600	.....	.....
Coalinga ⁴	WOT	.....	300,600	.....	.....
Colon (WHO) ⁵	WHO	Marconi...	300,600	4 c. (0.20 fr.)...	40 c. (2 fr.)...
Dayton ¹	KNP	.....	300,600	.....	.....
Moreni ¹	KNX	.....	300,600	.....	.....
Northern Pacific* ⁶	WTM	Marconi...	300,600	4 c. (0.20 fr.)...	40 c. (2 fr.)...
Pioneer ¹	KIG	.....	300,600	.....	.....
Polarine.....	KOI	.....	300,600	.....	.....
Santiago ³	KWE	.....	300,600	.....	.....
Satsuma ⁷	KJI	Marconi...	300,600	.....	.....
Vico* ¹	KNN	Marconi...	300,600	4 c. (0.20 fr.)...	40 c. (2 fr.)...
William O'Brien* ⁸	KPN	Marconi...	300,600	4 c. (0.20 fr.)...	40 c. (2 fr.)...
Wm. E. Chapman ⁹	KRM	.....	300,600	.....	.....

* Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.

¹ Standard Oil Co. of New Jersey, owner of vessel.

² John A. Hooper, owner of vessel.

³ New York & Cuba Mail Steamship Co. (Ward Line), owner of vessel.

⁴ Union Steamship Co., owner of vessel.

⁵ American-Mexican Steamship & Trading Co., owner of vessel.

⁶ Great Northern Pacific Steamship Co., owner of vessel.

⁷ Barber & Co., owner of vessel.

⁸ East Coast Transportation Co., owner of vessel.

⁹ Merritt & Chapman Derrick & Wrecking Co., owner of vessel.

SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Call signal.	Station.	Call signal.	Station.
KIG	Pioneer.	KRM	Wm. E. Chapman.
KJI	Satsuma.	KWE	Santiago.
KNG	Bradford.	KWI	Camaguey.
KNN	Wico.	WHO	Colon.
KNP	Dayton.	WIM	Northern Pacific.
KNX	Moreni.	WOR	California.
KOI	Polarine.	WOT	Coalinga.
KPN	William O'Brien.		

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the list of radio stations of the United States only.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Hartford, Conn.....	1ZC	200, 300, 425, 600...	P	X	Harry E. Chapman.
Kansas City, Mo.....	9XK	Variable.....	P	X	Robert R. Moore.
Lexington, Mass.....	1ZD	200, 425, 600.....	P	X	Samuel W. Dean.
Penikese, Mass.....	1ZP	200, 300, 425, 600.....	P	X	James A. B. Thomas.
Springfield, Ill.....	9ZS	600, 2000.....	P	X	Illinois Watch Co.
St. Louis, Mo.....	9XV	850, 1200, 1500, 2000.	P	X	Washington University.

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
1ZC	First district:		
1ZD	Hartford, Conn.	9XK	Ninth district:
1ZP	Lexington, Mass.	9XV	Kansas City, Mo.
	Penikese, Mass.	9ZS	St. Louis, Mo.
			Springfield, Ill.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made in the list of radio stations of the United States, and in the International List of Radiotelegraph Stations published by the Berne bureau.]

HILLCREST (DALY CITY), CAL.—Range, 200; system, Marconi, 340.

HOBOKEN, N. J.—Range, 400; system, Marconi, 1000; W. L., 2250; service, PR; hours, X. Notes: Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Station limited to correspondence with land stations at Scranton, Pa., Binghamton, N. Y., and Buffalo, N. Y., and with trains of the Delaware, Lackawanna & Western Railroad, and is for the purpose of transacting that company's railroad business.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made in the list of radio stations of the United States, and in the International List of Radiotelegraph Stations published by the Berne bureau.]

ADMIRAL DEWEY.—System, Marconi, 400.

ADMIRAL SCHLEY.—System, Marconi, 400.

ALAMEDA.—Strike out range; system, Kilbourne & Clark; strike out rates. Note, Alaska Steamship Co., owner of vessel.

ANTILLES.—System, Marconi, 400.

- CALAMARES.**—Range, 500; system, composite, 1,000; service, PG; hours, N; rates, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Tropical Radio Telegraph Co. Calamares Steamship Corp., owner of vessel.
- CHARLTON HALL.**—System, Marconi; rates 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. United States Steel Products Co., owner of vessel.
- COMUS (KKD).**—System, Marconi, 400.
- CONCHO.**—System, Marconi, 400.
- CORDOVA.**—Strike out all particulars.
- CORWIN.**—Strike out all particulars.
- DOLPHIN (WAU).**—Strike out all particulars.
- EDITH.**—Strike out all particulars.
- EL DIA.**—System, Marconi, 240.
- EL SIGLO.**—System, Marconi, 240; hours, X.
- E. R. STERLING.**—Range, 100; system, composite, 200; W. L., 300, 450, 600; service, P; hours, X. Notes, Radio station operated and controlled by Sterling Ship Co., owner of vessel.
- FALCON (WRK).**—Strike out all particulars.
- FIFIELD.**—Strike out all particulars.
- FINLAND.**—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG; hours, N; rates, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- GENERAL HUBBARD.**—Strike out all particulars.
- GEORGE W. FENWICK.**—Strike out all particulars.
- JEFFERSON (KOD).**—System, Marconi, 400.
- JEFFERSON (WAJ).**—Strike out range; system, Kilbourne & Clark; strike out service; strike out hours; strike out rates. Note, Alaska Steamship Co., owner of vessel.
- LAMPASAS.**—System, Marconi, 400.
- LATOUCHE.**—Strike out all particulars.
- MADISON.**—System, Marconi, 400.
- MARIPOSA.**—Strike out range; strike out system; strike out rates. Note, Alaska Steamship Co., owner of vessel.
- MORRO CASTLE.**—System, Marconi, 400.
- NEW YORK (KSN).**—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG; hours, N; rates, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. International Mercantile Marine Co. (American Line), owner of vessel.
- NOME CITY.**—Strike out all particulars.
- NORTHWESTERN (WAN).**—Strike out all particulars.
- NUECES.**—System, Marconi, 400.
- PHILADELPHIA (KSM).**—System, Marconi, 480.
- PIONEER (WPN).**—Strike out all particulars.
- PRINCESS ANNE.**—System, Marconi, 400.
- ROBERT DOLLAR.**—Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram.
- SACRAMENTO (WIA).**—Strike out all particulars.
- SANTA ANA.**—Strike out all particulars.
- SEWARD.**—Strike out all particulars.
- SIERRA.**—System, Poulsen arc. Notes, Radio station operated and controlled by the Federal Telegraph Co. Oceanic Steamship Co., owner of vessel.
- ST. PAUL (KSO).**—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG; hours, N; rates, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. International Mercantile Marine Co. (American Line), owner of vessel.
- TATOOSH.**—Strike out all particulars.
- TYEE.**—Strike out all particulars.
- VICTORIA.**—Strike out all particulars.
- WAKIVA (WLA).**—Strike out all particulars.
- WASHINGTONIAN.**—Strike out all particulars.
- YAGUEZ.**—Strike out all particulars.

SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out particulars after the following call signals: KDY, WAD, WAE, WAI, WAL, WAN, WAR, WAU, WAV, WIA, WKW, WLA, WMT, WNG, WNN, WPC, WPE, WPN, WRF, WRK, WRN.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made in the list of radio stations of the United States only.]

BELOIT, WIS.—W. L., 300, 600, 900 variable.

LOS ANGELES, CAL.—W. L., 300, 485, 600 variable.

SLINGERLANDS, N. Y.—W. L., 200, 300, 600, 1000, 1200, 2000, 5500. Radio station controlled by C. F. & B. V. Deitz.

MISCELLANEOUS.

RADIO STATIONS OF THE UNITED STATES.

[Oct. 1, 1914.]

Commercial and special land stations.

Controlled by—	General public.	Limited public.	Limited commercial.	Government official.	Special. ¹	Total.
United States Navy.....	23			25		48
United States Coast Guard Service.....				1		1
United States Army.....	7			32		39
Superintendent United States Capitol Building and Grounds.....				1		1
Insular government, Philippine Islands.....	6					6
Marconi Co.....	58	3	1			62
National Electric Signaling Co.....	1	1	1			3
Tropical Radio Telegraph Co.....	2					2
Federal Telegraph Co.....		6	2			8
Mutual Telephone Co., Hawaii.....	3	2				5
Atlantic Communication Co.....	2					2
Delaware, Lackawanna & Western R. R. Co.....			4			4
Unclassified.....	3		5		54	62
Total.....	105	12	13	59	54	243

Ship stations.

Controlled by—	Number.	Controlled by—	Number.
United States Navy.....	248	Tropical Radio Telegraph Co.....	21
United States Coast Guard Service.....	25	Atlantic Communication Co.....	15
United States Army.....	34	Unclassified.....	197
United States Department of Commerce.....	6		
Marconi Co.....	330	Total.....	895
National Electric Signaling Co.....	19		

Amateur stations licensed.²

District and headquarters.	Number.	District and headquarters.	Number.
1. Boston, Mass.....	374	7. Seattle, Wash.....	114
2. New York, N. Y.....	503	8. Cleveland, Ohio.....	456
3. Baltimore, Md.....	543	9. Chicago, Ill.....	172
4. Savannah, Ga.....	36		
5. New Orleans, La.....	562	Total.....	2,796
6. San Francisco, Cal.....			

¹ Including experimental and special amateur.

² To July 1, 1914.

Summary of radio stations of the United States.

Kind of station.	Number.	Kind of station.	Number.
Government land stations.....	95	Government land and ship stations.....	408
Private, commercial, and special land stations.....	148	Private, commercial, special, and private land and ship stations.....	730
Total.....	243	Total.....	1,138
Government ship stations.....	313	Amateur stations licensed.....	2,796
Private, commercial, and private ship stations.....	532	Grand total.....	3,934
Total.....	895		

COMMERCIAL OPERATOR'S LICENSE SUSPENDED.

Under authority of the Radio Communication Laws and Regulations of the United States, page 49, paragraph 5, one of the United States coast guard cutters was recently conducting a range test with a merchant vessel at sea and considerable difficulty was experienced in establishing communication. The operator on the merchant vessel became exasperated and asked the operator on the coast guard cutter why he did not learn to receive, thereby violating the Regulations.

In accordance with section 3 of the act of August 13, 1912, his commercial first-grade license has been suspended by the Secretary of Commerce for a period of one month.

GASOLINE ENGINES.

Gasoline engines may not be installed and operated as a source of auxiliary electric power on passenger vessels previous to the promulgation of the Steamboat-Inspection Service Regulations. The board is now in session.

Those contemplating such installations should bear in mind that the engine should be located with the same view to safety and effective operation as approved storage-battery equipments.

Attention is invited to the act of July 23, 1910, amended June 24, 1912, which requires "auxiliary power supply," and to the service regulations of the London Convention, Article XI, which provides that such emergency power supply shall be located with a view to greatest possible protection against accident, to be determined by the Government issuing the wireless license. Attention is also invited to the laws and regulations, page 49, paragraph 2, which states that the transmitting apparatus operated from the emergency power supply should be capable of functioning within two minutes after unexpected notice to the operator.

COMMERCIAL EXTRA FIRST-GRADE OPERATORS.

The names of the following operators have been added to the list of those to whom commercial extra first-grade licenses have been issued by the Secretary of Commerce, as a reward for long and efficient service: H. W. Sinclair and E. W. Lovejoy, San Francisco, Cal., and J. H. Benson, Philadelphia, Pa.

COMMERCIAL OPERATOR PENALIZED.

About a year ago an operator holding a second-grade commercial operator's license changed the face of his license to read "Commercial first grade," and secured employment thereunder as a commercial first-grade operator.

The case came to the attention of the Department when the operator applied for a renewal of his license, and the Secretary of Commerce suspended his license for a period of one year, and, furthermore, all the papers in the case have been referred to the United States district attorney for prosecution for forgery.

OPERATOR EXAMINATIONS.

The act of August 13, 1912, providing for the licensing of commercial radio operators went into effect December 13, 1912. These licenses are issued for a period of two years, and during the past few months a great deal of attention has been given to their renewal. The attention of all radio operators is invited to the Radio Communication Laws of the United States, edition of July 27, 1914, page 66, paragraphs 152 to 162, inclusive.

Under certain conditions prescribed in the regulations, renewal licenses may be issued without examination, but all operators are warned that they should keep well informed as to the manipulation and operation of modern radio apparatus, and that it is necessary for them to keep posted in regard to any new radio laws or regulations.

Recently an operator holding a commercial first-grade operator license applied to one of the radio inspectors for a renewal of his license without examination, but the service record on the back of his license did not show the required service, so that the applicant was informed that he must take another examination. He took the examination and attained an average of only 36.5 per cent, which did not entitle him to hold even a commercial second-grade license.

Shortly after he had taken the examination he submitted a letter, sworn to by his employer, stating that he had been employed and served as a radio operator on ships during the 90 days specified in the regulations. This affidavit might have been accepted as evidence of satisfactory service in lieu of the service record except that the examination which the operator took demonstrated that the affidavit was not satisfactory evidence and indicated clearly that the applicant was not entitled to hold a first or second grade license under the requirements.

The present regulations and examinations concerning the renewal of operator licenses and reexamination were drawn up with a particular view to eliminate from the ranks those operators who fail to keep abreast of the times.

Any regulation similar to that concerning the reexamination of operators, where a division line is sharply drawn, is bound to appear to be a hardship in some cases.

Referring further to the whole question of the examination of operators, attention is invited to an article in volume 2, number 3, of the "Proceedings of the Institute of Radio Engineers," by V. Ford

Greaves, radio engineer of the Bureau of Navigation. Particular reference is made to the chapter under the heading "Technical knowledge," pages 201 to 204, inclusive.

The operator examination question sheets under the heading "Instructions" provide: "The questions are short, but applicants are expected to state clearly their full knowledge of each subject." No doubt those operators who have performed satisfactory service under a commercial first-grade license, but who fail in the examination for renewal of same, will study and procure their licenses at their next examination. When the operators now holding commercial first-grade licenses become familiar with the requirements concerning reexamination they will undoubtedly take the necessary steps to properly prepare themselves for the reexamination, which is the Bureau's intention.

STORAGE BATTERIES.

The following data concerning the care, operation, and testing of storage batteries are published for the information and guidance of radio inspectors, and it is believed that the information will be valuable to operators and others concerned with the maintenance of storage-battery equipments. Similar data concerning the inspection of the Edison storage battery may be published in a future edition.

With a view to obtaining uniform and consistent inspections and tests of the storage batteries furnished as the auxiliary source of power supply for the radio equipments on board ships, required by the act of July 23, 1912, amending the act of June 24, 1910, the following instructions covering suitable tests are issued:

It is probable that storage batteries of sufficient size and number to be used as the reserve power for the main motor generator set will soon come into more general use.

Tests involving discharging the battery are both uncertain in cases of partial charge and require too much time and aggravate the condition it is desired to correct. Therefore the tests indicated hereafter are made by putting the battery on charge. In addition, the general condition of storage batteries should be noted as to—first, cleanliness (battery trays should be kept clean and dry and free from electrolyte, which tends to short circuits and grounds); second, connections (all connections should be tight and free from verdigris); third, installation (cells or trays should be securely fastened in position to prevent accident in heavy weather or when vessel has listed considerably, conditions probable in emergency); fourth, maintenance (all caps, stoppers, or valves should be in proper position).

Data regarding the storage batteries should be posted in the radio room. This information should indicate the make, type, size, and the charging rates of the cells; also, if possible, information regarding the electrolyte, including information regarding the specific gravity before and after the charges, and records of charge and if any changes have been made in electrolyte.

The tests indicated hereafter may take a maximum of one-half hour time, so that tests should be started immediately on boarding vessel. Arrangements must be made to see that ship voltage is maintained at the proper or normal value. The charging amperage should be known, but the resistance of most panels are fixed so that standard

types will soon be familiar to inspectors. It must be remembered that the batteries provided on vessels may exceed the necessary capacity required to make the set comply with the law, and this fact must be considered before a battery can be rejected. The tests prescribed hereafter are approved by the manufacturers of the different types of batteries involved and a persistent use of the information gained by these tests, if brought to the attention of the proper authorities, will undoubtedly result in an improved maintenance of this equipment. Instructions covering the tests of the batteries made by the Electric Storage Battery Co. are furnished herewith.

The following instructions apply to the inspection of chloride, exide, and ironclad exide types of lead batteries made by the Electric Storage Battery Co., Philadelphia, Pa.:

Types of batteries.—Batteries in wireless service on shipboard, as supplied by the Electric Storage Battery Co., are of several types, viz, exide, chloride, or ironclad exide, and are assembled in rubber jars in wood trays.

Each tray bears a name plate. In the case of exide and ironclad exide the name plate gives the type, number of cells, charging rates, discharge rating, and the normal full-charge specific gravity of the electrolyte. In batteries of the chloride type, the name plate gives the catalogue number of the tray and the normal charging rate.

Voltage.—Put battery on charge at current rate, which is used for giving the battery its overcharge or equalizing charge as defined hereafter.

The charging panels for these types of battery are supposed to be designed so that the proper charging rates are obtained for the following tests when the ship voltage is kept up to normal. Radio inspectors must therefore see that the ship voltage is kept at proper value during the test.

All exide types of batteries on test should be charged at within 10 per cent of the finishing rate. This rate for the different types is rated on the name-plate data and is shown in the accompanying tables. All chloride batteries on test should be charged at within 10 per cent of the normal charging rate as shown on the name plate and in the accompanying tables. For chloride cells, the "finishing" and "normal" charge rates are the same. For exide cells the "finishing" rates are specially indicated.

If the closed current voltage of the battery, under proper charge rate, stops rising within 30 minutes—i. e., reaches a maximum, which is above 2.45 volts per cell (it may go as high as 2.65 volts per cell or over) and cells are gassing freely—battery can be considered as charged. If at the end of 30 minutes proper charge the battery voltage is still rising, but is an average of 2.45 volts per cell, and cells are gassing quite freely, battery can be assumed to be within 15 per cent of being charged—i. e., they can be considered as capable of furnishing within 15 per cent of rated normal full-charge capacity.

If at the end of 30 minutes battery voltage is below an average of 2.45 volts per cell, or cells are gassing but slightly or not at all, battery can not be considered as charged within 15 per cent of full capacity and should be put on charge and charge completed without delay.

Just before the end of charge, read the voltage of one or two cells of each tray of battery with the low-reading voltmeter provided and if these cell-voltage readings agree closely with the average cell

voltage of the battery (found by dividing the battery voltage by the number of cells in battery), it can safely be assumed that all cells are uniform in voltage and no more cell-voltage readings need be taken. If the cell voltages are above the average cell voltage of battery, as defined above, an inspection should be made to discover the defective cells, the presence of which is indicated.

Cell voltages at the end of each of the test charges outlined above will be found to vary somewhat between different batteries, due to type variation, temperature, or age and conditions of plates, and for this reason a fixed voltage value can not be used in these tests.

However, the minimum voltage required in the above tests—namely, 2.45 volts per cell—is considered to allow for all possible conditions which may be encountered and to be equitable to the ship station to a degree which the inspector may safely require. These voltage requirements also apply to the lead batteries made by the European companies affiliated with the Electric Storage Battery Co.

Electrolyte.—The specific gravity of the electrolyte in lead cells is an excellent indication of the condition of the battery if the values and treatments previous to the test are known. If the readings at the end of the last full charge are known and no changes have been made in electrolyte, the readings at the time of tests are reliable indications as to the state of discharge.

So far it has been impracticable to obtain reliable specific gravity data for ship storage batteries, and only those readings taken by radio inspectors can be relied upon and the voltage tests outlined must be the main basis for determining the condition.

Specific gravity.—If time permits, take a few specific-gravity readings of the electrolyte of several cells in different trays as a check on the general condition of the battery.

Marked variation in the specific gravity in the different cells of the battery may be an indication of trouble in the cells in which the gravity is low, and such cells should be carefully checked up, taking voltage readings when charging and noting whether these cells gas equally with other cells.

The specific gravity falls during discharge and rises during charge, and can be used as an indication of the state of charge of the battery provided the gravity at the end of the last full charge is known.

In batteries of the exide and ironclad exide type the normal gravity at full charge is 1.280 at 70° F., but a variation down to 1.250 is allowed. For batteries of the chloride type the normal full-charge gravity is 1.210 at 70° F. with an allowable variation down to 1.190.

As the temperature affects the gravity this must be considered and corrections made as follows: To correct the gravity to normal temperature (70° F.), subtract one point for each 3° F. below 70°, and add one point for each 3° above 70° F. For example, electrolyte which is 1.283 at 61°, or 1.277 at 79°, will be 1.280 at 70°; if 1.213 at 61° or 1.207 at 79°, it will be 1.210 at 70°.

Gassing.—All cells should gas uniformly.

Height of electrolyte.—Remove vent plugs from several cells throughout the battery to make sure the electrolyte covers the plates.

Connections.—See that terminals and connections are tight and free from corrosion.

Additional.—Additional information regarding the batteries manufactured by the Electric Storage Battery Co. can be obtained from the pamphlets and publications issued by this company.

The installation of a recording ampere-hour meter is strongly recommended for all storage battery equipments on shipboard.

TABLE OF CHLORIDE PORTABLE BATTERIES.

[Normal ampere hour capacity can be determined by multiplying the normal discharge rate by 8.]

Cat. No.	Cells in case.	Type and number of plates.	Rate of normal charge and discharge.	Outside dimensions of case.			Height over lugs.	Weight complete.
				Length.	Width.	Height.		
			Amps.	Inches.	Inches.	Inches.	Inches.	Pounds.
801.....	1	"C" 3	1½	3½	5½	8½	10½	8
802.....	2	"C" 3	1½	5½	5½	8½	10½	14
803.....	3	"C" 3	1½	7	5½	8½	18½	20
304.....	4	"C" 3	1½	8½	5½	8½	10½	26
305.....	5	"C" 3	1½	10½	5½	8½	10½	32
401.....	1	"D" 3	2½	3½	7½	10½	11½	15
402.....	2	"D" 3	2½	5½	7½	10½	11½	26
403.....	3	"D" 3	2½	7	7½	10½	11½	37
404.....	4	"D" 3	2½	8½	7½	10½	11½	48
405.....	5	"D" 3	2½	10½	7½	10½	11½	59
406.....	1	"D" 5	5	4½	7½	10½	11½	24
407.....	2	"D" 5	5	7	7½	10½	11½	43
408.....	3	"D" 5	5	9½	7½	10½	11½	62
409.....	4	"D" 5	5	13	7½	10½	11½	81
410.....	5	"D" 5	5	15½	7½	10½	11½	100
411.....	1	"D" 7	7½	5½	7½	10½	11½	33
412.....	2	"D" 7	7½	9½	7½	10½	11½	58
413.....	3	"D" 7	7½	13	7½	10½	11½	83
414.....	4	"D" 7	7½	16½	7½	10½	11½	108
415.....	5	"D" 7	7½	20½	7½	10½	11½	133
501.....	1	"E" 5	10	4½	9½	12½	13½	33½
502.....	2	"E" 5	10	7½	9½	12½	13½	60
503.....	3	"E" 5	10	10	9½	12½	13½	86½
504.....	4	"E" 5	10	13½	9½	12½	13½	113½
505.....	5	"E" 5	10	15½	9½	12½	13½	140
506.....	1	"E" 7	15	5½	9½	12½	13½	42½
507.....	2	"E" 7	15	9½	9½	12½	13½	82½
508.....	3	"E" 7	15	13½	9½	12½	13½	122½
509.....	4	"E" 7	15	17½	9½	12½	13½	163

EXIDE BATTERY DATA, SHOWING FINISHING CHARGE RATE.

Plates in jar.	M. V. ironclad exide.					M. V. exide.				
	Charge rate.		4½ hours discharge.	A. H. capacity.	Width of 1½-rib jars. ¹	Charge rate.		4 hours discharge.	A. H. capacity.	Width of 1½-rib jars. ¹
	Start.	Finish.				Start.	Finish.			
	Amps.	Amps.	Amps.		Inches.	Amps.	Amps.	Amps.		Inches.
7.....	19	8	21	94½	2½	19	8	21	84	2½
9.....	24	10	28	126	3½	24	10	28	112	3½
11.....	30	12	35	157½	4½	30	12	35	140	4½
13.....	35	14	42	189	5	40	16	49	168	5
15.....	40	16	49	220½	5½	45	18	56	196	5½
17.....	45	18	56	252	6½	51	20	63	224	6½
19.....	51	20	63	283½	7½	56	22	70	252	7½
21.....	56	22	70	315	8					8

¹ These jars have a uniform length of 6½ inches and height of 12½ inches.

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RADIO SERVICE BULLETIN

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Washington, March, 1915—No. 3

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instructions, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the list of Radio Stations of the United States, and will contain information concerning Government, commercial, and special stations only. Information regarding amateur stations will appear only in the annual edition of the list of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the list of Radio Stations of the United States and the list of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) will be printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws will be printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
E. F. SWEET,
Acting Secretary.

ABBREVIATIONS.

INTERNATIONAL ABBREVIATIONS USED IN THIS LIST.

Nature of service:

PG=General public

PR=Limited public or limited commercial.

P=Private.

O=Government business exclusively.

Hours of operation:

N=Continuous service.

X=No regular hours.

m=a. m.

s=p. m.

12 m=Midday.

12 s=Midnight.

fr.=Francs (francs).

c.=Cents.

OTHER ABBREVIATIONS.

Name =Name of station.

G. loc. =Geographical location (O=west longitude, N=north latitude).

Call =Radio call letters.

System=Radio system used and sparks per second.

Range =Normal range in nautical miles.

W. L. =Wave lengths.

Service=Nature of service.

Hours =Hours of operation.

Rates =Ship or coast charges in francs and dollars.

Notes =Refers to notes in the Berne list.

Co. =Company.

NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the list of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Longitude and latitude (approximate).	Call signal.
Akron, Ohio ¹	O 81 33 00	WOI
	N 41 06 00	
Detroit, Mich ¹	O 83 04 00	WOK
	N 42 19 00	

¹ Radio station operated and controlled by the Goodyear Tire & Rubber Co.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the list of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name.	Call signal.	System.	Wave lengths.	Ship rate.	
				Per word.	Minimum per radiogram.
Antilla ¹	KWD	.....	300, 600	.....	.....
Ardmore ²	KIA	.....	300, 600	.....	.....
Balboa ³	WHU	Marconi.....	300, 600	4 c. (0.20 fr.)	40 c. (2 fr.)
Corning ⁴	KIH	.....	300, 600	.....	.....

¹ Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.² New York & Cuba Mail Steamship Co. (Ward Line), owner of vessel.³ Standard Oil Co. of New Jersey, owner of vessel.⁴ American-Mexican Steamship & Trading Co., owner of vessel.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS—continued.

Name.	Call signal.	System.	Wave lengths.	Ship rate.	
				Per word.	Minimum per radiogram.
Dacia * ¹	KGD	Marconi, 500.....	300, 600	4 c. (0.20 fr.)	² 40 c. (2 fr.)
Despatch * ⁴	WOA	Marconi.....	300, 600	8 c. (0.40 fr.)	³ 80 c. (4 fr.)
Georgiana * ⁵	KJE	do.....	300, 600	4 c. (0.20 fr.)	40 c. (2 fr.)
Guantanamo * ⁶	KWN	do.....	300, 600		
Latouche * ⁷	WAI	Kilbourne & Clark.....	300, 600		
Owera * ⁸	KZG	Marconi.....		4 c. (0.20 fr.)	40 c. (2 fr.)
Petrolite * ⁹	KIF	do.....	300, 600		
Santa Ana * ⁷	WAL	Kilbourne & Clark.....	300, 600	4 c. (0.20 fr.)	40 c. (2 fr.)
Westwego * ¹⁰	KGE	Telefunken, 1,000.....	300, 600	4 c. (0.20 fr.)	² 40 c. (2 fr.)
				12 c. (0.60 fr.)	³ \$1.20 (6 fr.)

* Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.

¹ Edward N. Breitung, owner of vessel. The station has a range of 150 miles, general public service, with no regular hours.

² North and South American service.

³ Transoceanic service.

⁴ Border Line Transportation Co., owner of vessel.

⁵ Walker, Armstrong Co., owner of vessel.

⁶ New York & Cuba Mail Steamship Co. (Ward Line), owner of vessel.

⁷ Alaska Steamship Co., owner of vessel.

⁸ Peter C. Gerry, owner of vessel (yacht).

⁹ Standard Oil Co. of New Jersey, owner of vessel.

¹⁰ Radio station operated and controlled by the Union Petroleum Steamship Co., owner of vessel. The station has a range of 200 miles, general public service, with no regular hours.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Station.	Call signal.	Station.
KGD	Dacia.....b	KZG	Owera.....b
KGE	Westwego.....b	WAI	Latouche.....b
KIA	Ardmore.....b	WAL	Santa Ana.....b
KIF	Petrolite.....b	WHU	Balboa.....b
KIH	Corning.....b	WOA	Despatch.....b
KJE	Georgiana.....b	WOI	Akron, Ohio.....c
KWD	Antilla.....b	WOK	Detroit, Mich.....c
KWN	Guantanamo.....b		

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the list of Radio Stations of the United States, edition of July 1, 1914, only.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Agricultural College, N. Dak.	9YG	300, 480, 600, variable.	P	X	North Dakota Agricultural College.
Canal Dover, Ohio.....	8ZX	450, 600.....	P	X	Harry S. Weber.
Cincinnati, Ohio.....	8ZF	200, 300, 450, 600..	P	X	Henry M. Rubel, jr.
Columbus, Ohio.....	8YO	400.....	P	X	Ohio State University.
Farmington, Conn.....	1ZZ	200, 300, 425, 600..	P	8s-12s	David Lyon Moore.
Hamilton, Ohio.....	8ZU	300, 600, 8000.....	P	X	Doron Bros. Electric Co.
Hartford, Conn.....	1ZM	200, 300, 425, 600..	P	7s-11s	Hiram Percy Maxim.
Illioipolis, Ill.....	9ZK	200, 300, 450, 600..	P	X	Harry J. E. Knotts, "State-Center Record."
New York, N. Y.....	2XU	300, 600, 2000, 40,000, variable.	P	X	Peter Cooper Hewitt.
Northampton, Mass.....	1ZL	200, 300, 425, 600..	P	X	Dean A. Lewis.
Springfield, Ohio.....	8ZM	300, 450, 600.....	P	X	Ross McGregor.
St. Louis, Mo.....	9YR	150, 600.....	P	X	St. Louis University.
Wheeling, W. Va.....	8ZW	300, 450, 600, 1800..	P	X	John C. Stroebel, jr.

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
1ZL	First district:	8ZM	Eighth district—continued.
1ZM	Northampton, Mass.	8ZU	Springfield, Ohio.
1ZZ	Hartford, Conn.	8ZW	Hamilton, Ohio.
	Farmington, Conn.	8ZX	Wheeling, W. Va.
2XU	Second district:		Canal Dover, Ohio.
	New York, N. Y.		Ninth district:
8YO	Eighth district:	9YG	Agricultural College, N. Dak.
8ZF	Columbus, Ohio.	9YR	St. Louis, Mo.
	Cincinnati, Ohio.	9ZK	Illinois, Ill.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

Alterations and corrections to be made in the list of Radio Stations of the United States, edition of July 1, 1914, and in the International List of Radiotelegraph Stations, published by the Berne bureau.]

Hollister, Cal.—G. loc. (approximate), O 121° 24' 00", N 36° 55' 43"; system, composite, 120 or 240; W. L., 300, 600, 1650.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

Alterations and corrections to be made in the list of Radio Stations of the United States, edition of July 1, 1914, and in the International List of Radiotelegraph Stations, published by the Berne bureau.]

A. G. LINDSAY.—Name, Pavlov.

ALMIRANTE.—Range, 500; system, composite, 1000; hours, N; rates, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Tropical Radio Telegraph Co. Almirante Steamship Corporation, owner of vessel.

ARGYLL (WTB).—Strike out system; strike out rates. Note, Union Steamship Co. (Union Oil Co.), owner of vessel.

CARILLO.—Name, Carrillo; range, 500; system, composite, 1000; service, FG; hours, N; rates 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Tropical Radio Telegraph Co., Carrillo Steamship Corporation, owner of vessel.

CITY OF EVERETT.—Range, 250; system, Telefunken, 1000; W. L., 300, 600; service, PG; hours, 9m–12m, 2s–5s, 8s–10.30s; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Atlantic Communication Co. Standard Oil Co. of New York, owner of vessel.

COALINGA.—Note, Union Steamship Co. (Union Oil Co.), owner of vessel.

CRASTER HALL.—System, Marconi; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram.

DORA.—Strike out system; W. L., 300, 600; strike out rates. Note, Alaska Steamship Co., owner of vessel.

EL ALBA.—System, Marconi, 240; hours, X.

EL CID.—Hours, X.

EL NORTE.—Range, 200; system, Marconi, 400; W. L., 300, 600; service, PG; hours, X; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Southern Pacific Co., owner of vessel.

EL SUD.—System, Marconi, 240; hours, X.

GOLIAH.—System, Kilbourne & Clark.

HERMAN FRASCH.—Range, 250; system, Telefunken, 1000; hours, 9m–12m, 2s–5s, 8s–10.30s. Notes, Radio station operated and controlled by the Atlantic Communication Co. Union Sulphur Co., owner of vessel.

IOWA (WFD).—Strike out all particulars.

MEDINA.—Range, 200; system, Marconi, 240; service, PG; hours, N; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Mallory Steamship Co., owner of vessel.

OCEANA.—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Bermuda-American Steamship Corporation, owner of vessel.

OHIOAN.—Range, 200; system, Telefunken, 1000; hours, 9m–12m, 2s–5s, 8s–10.30s; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Atlantic Communication Co. American Hawaiian Steamship Co., owner of vessel.

OLEUM.—Strike out system; W. L., 300, 600; strike out rates. Note, Fillmore Condit (Union Oil Co.), owner of vessel.

PASTORES.—Range, 500; system, composite, 1000; service, PG; hours, N; rates, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Tropical Radio Telegraph Co. Pastores Steamship Corporation, owner of vessel.

POLARINE.—Note, Standard Oil Co. of New York, owner of vessel.

RAYO.—Range, 250; system, Telefunken, 1000; W. L., 300, 600; service, PG; hours, 9m–12m, 2s–5s, 8s–10.30s; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Atlantic Communication Co. Standard Oil Co. of New York, owner of vessel.

ROMA (WTE).—Strike out system; W. L., 300, 600; strike out rates. Note, Union Steamship Co. (Union Oil Co.), owner of vessel.

SARATOGA (KWS).—System, Marconi, 240.

SEGURANCA.—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Edward N. Breitung, owner of vessel.

SOCONY.—Range, 250; system, Telefunken, 1000; W. L., 300, 600; service, PG; hours, 9m–12m, 2s–5s, 8s–10.30s; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Atlantic Communication Co. Standard Oil Co. of New York, owner of vessel.

TENADORES.—Range, 500; system, composite, 1000; service, PG; hours, N; rates, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Tropical Radio Telegraph Co. Tenadores Steamship Corporation, owner of vessel.

VENTURA.—Strike out range; strike out system; strike out rates. Note, Oceanic Steamship Co., owner of vessel.

WASHTENAW.—Strike out range; strike out system; strike out hours; strike out rates. Note, Union Steamship Co. (Union Oil Co.), owner of vessel.

WHITTIER.—Strike out range; strike out system; strike out hours; strike out rates. Note, Max Dyer (Union Oil Co.), owner of vessel.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KDE, read: Carrillo (b). Strike out particulars following call signal WFD. WNO, read: Pavlof (b).

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

Alterations and corrections to be made in the list of Radio Stations of the United States, edition of July 1, 1914, only.]

PENIKESSE, MASS.—Strike out all particulars

St. Louis, Mo. (9YC).—Call, 9XC; W. L., 700, variable.

SPECIAL LAND STATIONS, ALPHABETICALLY BY CALL SIGNALS.

1ZP—Strike out all particulars. 9YC—Change call to 9XC, placing information between 9XB and 9XD.

MISCELLANEOUS.

PRICES OF RADIO SERVICE PUBLICATIONS.

The list of Radio Stations of the United States, including amateur stations, is published annually as of July 1, and can be procured from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 15 cents per copy.

Copies of the Radio Communication Laws and Regulations of the United States, including the London Radiotelegraphic Convention, etc., may be procured from the Superintendent of Documents at 15 cents per copy.

All orders and inquiries should be addressed direct to the Superintendent of Documents, Government Printing Office, Washington, D. C. Remittances should be made to the Superintendent of Documents by means of coupons, postal or express orders, or certified checks. Postage stamps will not be accepted.

Inquiries concerning the purchase or subscription for the International List of Radio Stations of the World, the International List of Call Letters, and Supplements to both should be addressed direct to the International Bureau of the Telegraph Union, Radiotelegraphic Service, Berne, Switzerland.

OPERATOR'S SERVICE RECORDS.

All operators are warned that any illegal alteration or addition to the service record on the backs of radio operator licenses may constitute a forgery or alteration, and operators may be prosecuted therefor in addition to the suspension of their licenses.

WAVE LENGTHS AND INTERFERENCE.

With the opening of many high-power stations during the last two years the Bureau has received complaints of interference, particularly on the longer wave lengths.

Heretofore, in the issuing of licenses, in very few instances have wave lengths requested by commercial companies been refused. However, some consideration now must be given to the distribution of wave lengths, especially among high-power stations.

The act of August 13, 1912, to regulate radio communication, was designed to execute, in behalf of the United States, the international radiotelegraph convention, and thus to promote the orderly exchange of radiotelegrams.

Section 2 of the act empowers the Secretary of Commerce to specify the wave length or wave lengths which may be used by commercial stations, and hereafter particular attention will be given to this matter and in most cases but one or two wave lengths above 1600 meters will be authorized for high-power stations.

The attention of those concerned is particularly invited to the London Radiotelegraph Convention service regulations, Article XXXV, paragraph 2, concerning the use of the 1800-meter wave length.

Applicants desiring the use of additional wave lengths must submit with Form 761 a detailed statement of the purpose for which additional wave lengths are desired, and such statement will be considered with regard to wave lengths assigned to other stations.

A request for several wave lengths for the purpose of passing from one wave length to another to avoid interference will not be considered.

RADIO SERVICE PERSONNEL.

Changes March 1, 1915:

The headquarters of L. R. Krumm, chief radio inspector, have been transferred to New York.

W. D. Terrell, radio inspector in charge at New York, has been transferred to the radio division of the Bureau of Navigation at Washington.

V. Ford Greaves, radio engineer of the Bureau of Navigation, has been transferred to the radio field service at large and will make a tour of the various radio districts.

THE OHIO FLOOD.

During the recent flood in the Ohio Valley, the Secretary of Commerce detailed J. F. Dillon, radio inspector in charge at Cleveland, to supervise the operation of commercial and amateur radio stations in the district and to cooperate with the authorities to expedite the exchange of messages relative to life and property.

Fortunately the flood did not reach the proportions of the flood of two years ago, and land-line communication was not interrupted. However, Mr. Dillon arranged with the owners of several powerful amateur stations in the flood district to transmit messages if necessary.

Before leaving the district Mr. Dillon inspected many stations with a view to organizing a chain of stations, so that communication can be maintained in the event of a recurrence of the conditions which prevailed during the flood of 1913. Several special amateur station licenses have been granted upon his recommendations.

FALSE CALL LETTERS.

Recently a list of amateur radio stations, published by private parties, came to the attention of the Bureau, and it was observed that several of the call letters of the stations were irregular and probably in some cases constitute violations of the law.

Receiving stations and sending stations which are not required to be licensed under the law should use two-letter or other unofficial signals. All three-letter combinations and the numbers 1 to 9, followed by two or three letters, are official and can only be used by the stations to which they are assigned by the proper Government authority.

Any station using an official call letter or call signal other than that properly assigned may be prosecuted for a violation of section 7 of the act of August 13, 1912.

COMMERCIAL EXTRA FIRST-GRADE OPERATOR EXAMINATIONS.

Naval and other Government operators who submit satisfactory evidence, certifying 18 months' satisfactory service during the two years previous to the date of filing application as radio operator on a Government vessel or at a Government land station open to general public service, are eligible to take the examination for commercial extra first-grade operator licenses, as such service is essentially the same as private commercial service. Government operators are not required by law to hold operator licenses; therefore the requirement that applicants must hold commercial first-grade licenses is waived in such cases.

When the examination papers of applicants for commercial extra first-grade licenses are forwarded to the Bureau of Navigation, evidence of service should be attached showing the number of months of sea service and number of months of land service, as these particulars are incorporated in the licenses when issued.

LONDON RADIOTELEGRAPH CONVENTION.

The following is a list of the countries which have ratified or adhered to the London radiotelegraph convention, giving dates. The letters "A" and "R" denote adherence and ratification respectively.

Country.	Date.	Country.	Date.
Austria.....	Mar. 12, 1914 R	Japan.....	July 16, 1913 R
Belgium (including Belgian Congo).....	Nov. 23, 1912 R	Mexico.....	Oct. 6, 1913 A
Bosnia-Herzegovina.....	Mar. 12, 1914 R	Monaco.....	Dec. 10, 1912 R
Brazil.....	Dec. 18, 1914 R	Morocco.....	Nov. 2, 1914 R
Bulgaria.....	Apr. 27, 1914 R	Netherlands (including colonies).....	Mar. 20, 1913 R
Chile.....	Apr. 16, 1914 R	Nicaragua.....	May 27, 1914 A
Colombia.....	Aug. 25, 1914 A	Norway.....	Aug. 8, 1913 R
Cyrenaica.....	Jan. 13, 1914 A	Panama.....	July 14, 1914 A
Denmark.....	Apr. 29, 1913 R	Portugal.....	Dec. 2, 1913 R
Egypt.....	Feb. 1, 1913 R	Roumania.....	July 5, 1913 R
France (including French West Africa, French Equatorial Africa, Indo-China, Madagascar, and Tunis).....	Feb. 17, 1914 R	Russia.....	Apr. 5, 1913 R
Germany (including protectorates).....	July 5, 1913 R	San Marino.....	Aug. 1, 1913 R
Greece.....	July 24, 1914 R	Santo Domingo.....	July 1, 1913 R
Guatemala.....	July 10, 1914 A	Sarawak.....	Apr. 23, 1914 A
Honduras.....	Feb. 11, 1915 A	Siam.....	May 20, 1913 R
Hungary.....	Mar. 12, 1914 R	Spain.....	July 8, 1913 R
Italy (including colonies of Eritrea and Somalia).....	June 18, 1913 R	Sweden.....	Aug. 8, 1913 R
		Tripolitana.....	Jan. 13, 1914 A
		United Kingdom of Great Britain and Ireland.....	June 2, 1913 R
		United States of America.....	Feb. 21, 1913 R
		Zanzibar.....	July 14, 1913 A

NORMAL WAVE LENGTH.

Every coast station open to general public service is required to have a normal sending and receiving wave length of 600 meters and all general public service with ship stations must be conducted on 300, 600, or 1800 meters.

The Department interprets the radio laws and the London convention to require that every coast station, excepting general and restricted amateur, shall have a normal wave length of 600 meters for use in case of distress or emergency, and licenses issued for such stations so indicate.

The indication of a 600-meter normal wave length for a special station does not mean that the station shall use this wave length for its *normal* business. All radio communication, other than general public service, must be conducted on some authorized wave length other than 300, 600, or 1800 meters, but the station is required, when open and no special business is being conducted, to listen in with the receiving apparatus tuned to receive the 600-meter wave length and must be prepared to transmit on 600 meters if necessary.

The Radio Laws and Regulations, edition of July 27, 1914, page 52, paragraphs 38 to 50, inclusive, bear on this subject and paragraph 44 provides that all coast stations shall listen in at intervals of not more than 15 minutes and for not less than 2 minutes, with the receiving apparatus adjusted to receive a 600-meter wave length. The act of August 13, 1912, section 4, regulation 11, requires general public-service coast stations to listen in at intervals of not less than 15 minutes and for a period of not less than 2 minutes with the receiver tuned to receive messages of 300-meter wave lengths.

SPECIAL AMATEUR STATION LICENSES.

The organization of a chain of stations in the Ohio flood district and the organization of the American Radio Relay League has caused an influx of applications for special amateur station licenses.

The attention of all concerned is invited to the Laws and Regulations, edition of July 27, 1914, page 55, paragraphs 63 and 64. Applications will not be considered by the Department if these requirements are not complied with.

The Bureau is satisfied that the American Radio Relay League is organized with a view to complying with the Laws and Regulations in all particulars, and radio inspectors in submitting their recommendations to the Department as to the issue of special amateur station licenses will give due consideration to an indorsement on an application by the proper officers of the league.

If all the requirements of the Laws and Regulations are complied with, the Bureau will approve a limited number of special amateur inland station licenses for members of the league, authorizing the use of a wave length of 425 meters.

Very few, if any, special amateur station licenses will be approved for stations along the coast or in localities where the operation of such stations may interfere with maritime, Government, or commercial radio communication. All holders of special amateur station licenses or applicants therefor are warned that such licenses may be suspended or revoked if interference is caused by the working of the stations or if any of the Laws and Regulations are violated.

RADIO RATES INCREASED.

The Marconi Wireless Telegraph Co. of America has been authorized to increase the rate of its station at Miami, Fla., for limited public service with the British Government station at Nassau, Bahamas, from 6 cents to 12 cents per word, effective March 15, 1915.

AMENDMENTS.

The list of Radio Stations of the United States, edition of July 1 1914, is hereby amended, as follows:

Introduction, page 9, sentence commencing on the sixth line should read:

"The rates in the international list are stated in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent."

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, April, 1915—No. 4

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, January 14, 1915.

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This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instructions, and to those concerned with the operation of Government and commercial radio stations for their information.

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E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
E. F. SWEET,
Acting Secretary.

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Nature of service:

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PR=Limited public or limited commercial.

P=Private.

O=Government business exclusively.

Hours of operation:

N=Continuous service.

X=No regular hours.

m=a. m.

s=p. m.

12 m=Midday.

12 s=Midnight.

fr.=Franc (francs).

c.=Cents.

OTHER ABBREVIATIONS.

Name =Name of station.

G. loc. =Geographical location (O=west longitude, N=north latitude).

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System=Radio system used and sparks per second.

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W. L. =Wave lengths.

Service=Nature of service.

Hours =Hours of operation.

Rates =Ship or coast charges in francs and dollars.

Notes =Refers to notes in the Berne list.

Co. =Company.

NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the list of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Range.	System.	Wave lengths.	Service.	Hours.
Brownsville, Tex.*	WUZ	250	U. S. Army, 500...	1000	O	X
Fort Barrancas, Fla.*	WZD	125	U. S. Army, 500...	1200	O	X
Fort Crockett, Tex.*	WUX	30	U. S. Army, 500...	1200	O	X
Fort Howard, Md.*	WZB	50	U. S. Army, 60...	1200	O	X
Fort Morgan, Ala. (WUR)*	WUR	30	U. S. Army, 500...	1200	O	X
Fort Rosecrans, Cal.*	WUS	30	U. S. Army, 500...	1200	O	X
Fort San Jacinto, Tex.*	WUY	30	U. S. Army, 500...	1200	O	X
Fort Screven, Ga.*	WZA	30	U. S. Army, 500...	1200	O	X
Fort Whitman, Wash.*	WZC	100	U. S. Army, 120...	1200	O	X
Port Royal, S. C. ¹	NAV	.....	U. S. Navy.....	.....	O	N
Victor, Colo. ^{2, 3}	KIW	160	Composite, 600....	600	(4)	9m-11.30m. 7.30s-11s.
Yerba Buena, Cal. ^{1, 5}	NPG	.....	U. S. Navy.....	.....	O	N

*Radio station operated and controlled by the United States Signal Corps, War Department, Washington, D. C.

¹ Radio station operated and controlled by the United States Naval Radio Service, Radio, Va.

*Radio station operated and controlled by the Ajax Gold Mining Co.

² G. loc., 0 105° 07' 00"-N. 38° 40' 00". (Approximate.)

³ The station is limited to correspondence with a station at Denver, Colo.

⁴ G. loc., 0 122° 22' 02"-N. 37° 48' 30."

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the list of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name.	Call signal.	System.	Range.	Wave lengths.	Service.	Hours.
Col. Geo. Armistead* ¹	WYG	U. S. Army, 500.....	150	600	O	X.
Cordova ²	WAR	Kilbourne & Clark.....		300, 600		
Evangeline ^{3, 4, 6}	KII	Marconi.....		300, 600		
Genl. R. H. Jackson* ⁶	WYW	U. S. Army, 500.....	30	400	O	X.
Genl. Robt. Swartout* ⁶	WYU	U. S. Army, 500.....	30	400	O	X.
Genl. S. B. Holabird* ⁶	WYV	U. S. Army, 500.....	30	400	O	X.
J. A. Moffett ^{3, 7}	WRE	Marconi.....		300, 600		
Lieut. A. H. Cushing* ⁶	WYX	U. S. Army, 500.....	30	400	O	X.
Lieut. Geo. M. Harris* ⁶	WYR	U. S. Army, 500.....	30	400	O	X.
Mexicano ⁸	KGM					
Muskogee ⁹	KIB			300, 600		
Security ^{3, 4, 10}	KSJ	Marconi.....				
Tatoosh ^{4, 11}	WPE	Kilbourne & Clark.....				
Ulysses ¹²	KPU					
Zara ^{3, 4, 12}	KZI	Marconi.....				

*Radio station operated and controlled by the United States Signal Corps, War Department, Washington, D. C.

¹ Army mine planter.

² Alaska Steamship Co., owner of vessel.

³ Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.

⁴ Rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram.

⁵ Alonzo W. Perry, owner of vessel.

⁶ Army tug.

⁷ Standard Oil Co. of California, owner of vessel.

⁸ Pierce Oil Corporation, owner of vessel.

⁹ Standard Oil Co. of New Jersey, owner of vessel.

¹⁰ Standard Oil Co. of New York, owner of vessel.

¹¹ Radio station operated and controlled by the Puget Sound Tug Boat Co., owner of vessel.

¹² Maryland Steel Co., owner of vessel.

¹³ F. J. Littlefield, owner of vessel (yacht).

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KGM	Mexicano.....b	WUX	Fort Crockett, Tex.....c
KIB	Muskogee.....b	WUY	Fort San Jacinto, Tex.....c
KII	Evangeline.....b	WUZ	Brownsville, Tex.....c
KIW	Victor, Colo.....c	WYG	Col. Geo. Armistead.....b
KPU	Ulysses.....b	WYR	Lieut. Geo. M. Harris.....b
KSJ	Security.....b	WYU	Genl. Robt. Swartout.....b
KZI	Zara.....b	WYV	Genl. S. B. Holabird.....b
NAV	Port Royal, S. C.....c	WYX	Genl. R. H. Jackson.....b
NPG	Yerba Buena, Cal.....c	WZA	Lieut. A. H. Cushing.....b
WAR	Cordova.....b	WZB	Fort Screven, Ga.....c
WPE	Tatoosh.....b	WZC	Fort Howard, Md.....c
WRE	J. A. Moffett.....b	WZD	Fort Whitman, Wash.....c
WUR	Fort Morgan, Ala.....c		Fort Barrancas, Fla.....c
WUS	Fort Rosecrans, Cal.....c		

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1914, only.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Auburn, N. Y.....	8YA	300, 440, 500, 600...	P	9-9.30m 2-2.30s 7-7.30s	Edward L. Colby (Colby's Telegraph School).
Beeville, Tex.....	5ZN	800, 450.....	P	X	Ed. Nettleton.
Buffalo, N. Y.....	8ZB	200, 300, 425, 600...	P	X	Nelson E. Holt.
Burlington, Iowa.....	9XL	200 to 550 variable.	P	X	Leslie W. Lyon.
Iowa City, Iowa.....	9YA	585.....	P	X	State University of Iowa.
Kane, Pa.....	8ZK	800, 425.....			John Fleming.
Schenectady, N. Y.....	2ZB	200, 300, 400, 500...	P	X	Wallace L. Brooks.

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
2ZB	Second district: Schenectady, N. Y.	8ZB	Eighth district—continued.
5ZN	Fifth district: Beeville, Tex.	8ZK	Buffalo, N. Y.
8YA	Eighth district: Auburn, N. Y.	9XL	Kane, Pa.
		9YA	Ninth district: Burlington, Iowa.
			Iowa City, Iowa.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the list of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

ARLINGTON, RADIO, VA.—Notes, Radio station operated and controlled by the United States Naval Radio Service, Radio, Va. The station sends time signals twice daily for five minutes on the wave length of 2,500 meters, commencing at 11.55m and 9.55s, Sundays and holidays included. Final signals at 12m and 10s (time of the meridian 75° west of Greenwich). Every tick of the standard clock of the Naval Observatory, Washington, D. C., is transmitted as a dot, omitting the twenty-ninth second of each minute, the last five seconds of each of the first four minutes, and finally the last 10 seconds of the last minute. The 12m and 10s signal is a dash.

BENTON HARBOR (WBN), MICH.—Strike out all particulars.

BOLINAS, CAL.—G loc. (exact) O 122° 43' 33", N. 37° 54' 48".

CAPE MAY, N. J.—Range, 150; W. L., 300, 550, 600.

EL PASO, TEX.—Strike out all particulars.

EUREKA (KPM), CAL.—Range, 200; system, Marconi; 226; W. L., 300, 600; hours, 8.30m–6s, 7.30s–5m.

EUREKA (NPW), CAL.—Notes, Radio station operated and controlled by the United States Naval Radio Service, Radio, Va. The station sends time signals daily at noon (time of the meridian 120° west of Greenwich), Sundays and holidays excluded, on the wave length of 1,400 meters. Signals same as for Arlington, Radio, Va. Time furnished by Observatory at Navy Yard, Mare Island, Cal.

FORT OMAHA, NEBR.—Strike out all particulars.

FORT WORTH, TEX.—Strike out all particulars.

GRAND MARAIS, MINN.—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. The station also communicates with Duluth, Minn.

KEY WEST, FLA.—Notes, Radio station operated and controlled by the United States Naval Radio Service, Radio, Va. The station sends time signals daily at noon (time of the meridian 75° west of Greenwich), Sundays and holidays included, on the wave length of 1,000 meters. Signals same as for Arlington, Radio, Va. Time furnished by the Naval Observatory at Washington, D. C.

MARE ISLAND, CAL.—Notes, Radio station operated and controlled by the United States Naval Radio Service, Radio, Va. The station sends time signals twice daily for five minutes on the wave length of 2,500 meters, commencing at 11.55m and 9.55s, Sundays and holidays included. Final signals at 12m and 10s (time of the meridian 120° west of Greenwich). Signals same as for Arlington, Radio, Va. Time furnished by Observatory at Navy Yard, Mare Island, Cal.

MIAMI, FLA.—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. The station also exchanges correspondence with Nassau (Bahamas), charge: 12 c. (0.60 fr.) per word, without minimum.

NEW ORLEANS (NAT), LA.—Notes, Radio station operated and controlled by the United States Naval Radio Service, Radio, Va. The station handles public correspondence in emergencies, when the coast rate will be furnished on request. The operator is generally at the receiver at the beginning of each hour. The station is open for the general benefit of shipping. The station sends out information concerning obstructions in paths of navigation such as wrecks, derelicts, etc., and aids to navigation deranged or misplaced four times daily, at 8m, 12m, 4s, and 8s. The station also sends local weather forecasts at 12m and storm warnings four times at hours mentioned above. The station furnishes above

information to passing ships at other hours on request. The station sends time signals daily at noon (time of the meridian 75° west of Greenwich), Sundays and holidays included, on the wave length of 1,000 meters. Signals same as for Arlington, Radio, Va. Time furnished by the Naval Observatory, Washington, D. C.

NEW YORK (WHB).—Notes, Radio station operated and controlled by the New York Herald Co. The station transmits daily news without charge, using a wave length of 1,610 meters. No charge is made for radiograms to or from naval vessels.

NORTH HEAD, WASH.—Notes, Radio station operated and controlled by the United States Naval Radio Service, Radio, Va. The station sends time signals daily at noon (time of the meridian 120° west of Greenwich), Sundays and holidays excluded, on the wave length of 2,000 meters. Signals same as for Arlington, Radio, Va. Time furnished by Observatory at Navy Yard, Mare Island, Cal.

PHILADELPHIA (WHE), PA.—Hours, 9m–5.30s.

SAN DIEGO (NPL), CAL.—Notes, Radio station operated and controlled by the United States Naval Radio Service, Radio, Va. The station sends time signals daily at noon (time of the meridian 120° west of Greenwich), Sundays and holidays excluded, on the wave length of 2,000 meters. Signals same as for Arlington, Radio, Va. Time furnished by Observatory at Navy Yard, Mare Island, Cal.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

Alterations and corrections to be made to the list of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

ADELINE SMITH.—Range, 200; system, Marconi, 120; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.

ADVANCE.—Note, Radio station operated and controlled by the Panama Railroad Co., owner of vessel.

ALASKAN.—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.

ALBERTA.—System, Marconi; rate, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. F. D. Bourne, owner of vessel (yacht.)

ALGONQUIN (KVG).—System, Marconi, 400.

AL-KI.—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Border Line Transportation Co., owner of vessel.

ALLIANCA.—Note, Radio station operated and controlled by the Panama Railroad Co., owner of vessel.

AMERICAN.—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.

ANCON.—Note, Radio station operated and controlled by the Panama Railroad Co., owner of vessel.

ARIZONAN.—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.

AROLINE.—Range, 150; system, Marconi, 240.

ASTRAL.—Range, 200; system, Marconi, 240; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of New York, owner of vessel.

ASUNCION (WTX).—System, Marconi, 120; W. L., 300, 600; service, PG. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of California, owner of vessel.

ATLAS (WTT).—Range, 150; system, Marconi, 290.

BALBOA.—Range, 150; system, Marconi, 240; service, PG; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.

BRABANT.—Range, 200; system, Marconi, 480; service, PG; hours, X.

CALIFORNIA (WOR).—Range, 150; system, Marconi, 240; service, PG; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. John A. Hooper, owner of vessel.

- CALIFORNIAN (WKC).**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- CAROLINA (KGB).**—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG; hours, N; rate, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram.
- CASSANDRA (KYE).**—Note, John J. Doyle, owner of vessel (yacht).
- CHICAGO (WAG).**—System, Kilbourne & Clark. Note, Radio station operated and controlled by the Booth Fisheries Co., owner of vessel.
- CITY OF EVERETT.**—Notes, Radio station operated and controlled by the Standard Oil Co. of New York, owner of vessel.
- CITY OF SOUTH HAVEN.**—Range, 150; system, Marconi, 120; W. L., 300, 600; service, PG; hours, X; rate, 2 c. (0.10 fr.) per word, 20 c. (1 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Chicago and South Haven Steamship Co., owner of vessel.
- COLON (KMX).**—Note, Radio station operated and controlled by the Panama Railroad Co., owner of vessel.
- COLON (WHO).**—Range, 150; system, Marconi, 240; service, PG; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- COLUMBIAN (WKS).**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- COLUSA.**—Range, 200; system, Marconi, 480; service, PG; hours, N; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- CORONADO.**—Range, 100; system, Marconi, 120; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- CRISTOBAL.**—Note, Radio station operated and controlled by the Panama Railroad Co., owner of vessel.
- DAMARA.**—Range, 200; system, Marconi, 480; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- E. G. CROSBY.**—Strike out all particulars.
- EL SEGUNDO.**—Range, 150; system, Marconi, 480; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- EVELYN.**—Strike out all particulars.
- FRANK H. BUCK.**—Range, 200; system, Marconi, 120; service, PG; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram; transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- GEORGIA (WFA).**—Range, 150; system, Marconi, 120; W. L., 300, 600; service, PG; hours, X; rate, 2 c. (0.10 fr.) per word, 20 c. (1 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Goodrich Transit Co., owner of vessel.
- GEORGIANA.**—Rate, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram.
- GULFLIGHT.**—Range, 200; system, Marconi, 240; service, PG; hours, X; rate, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram.
- HAWAIIAN.**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- HENRY T. SCOTT.**—Range, 150; system, Marconi, 480; W. L., 300, 600; service, PG; hours, X; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- HERMOSA.**—Range, 150; system, Marconi, 120; W. L., 300, 500, 600; hours, X; rate, 1 c. (0.05 fr.) per word, 10 c. (0.50 fr.) minimum per radiogram.
- IOWAN.**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- ISTHMIAN.**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- JAMESTOWN.**—Range, 400.
- KANSAN.**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.

- KENTUCKIAN.**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- LAKELAND.**—Range, 125; system, Marconi, 120.
- LAKEWOOD.**—Range, 100; system, Marconi, 240; W. L., 300, 600; service, PG; hours, X; rate, 2 c. (0.10 fr.) per word, 20 c. (1 fr.) minimum per radiogram.
- LANSING.**—Strike out range; strike out system. Note, Union Steamship Co. (Union Oil Co.), owner of vessel.
- LIGONIER.**—Range, 200; system, Marconi, 400; W. L., 300, 600; service, PG. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Gulf Refining Co., owner of vessel.
- LOUISE.**—Strike out all particulars.
- LYRA (WNF).**—Name, Hattie Luckenbach.
- MARIPOSA.**—System, Kilbourne & Clark.
- METAPAN.**—Range, 500; system, composite, 1000; service, PG; hours, N; rate, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Tropical Radio Telegraph Co. Metapan Steamship Corporation, owner of vessel.
- MEXICAN.**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- MILLINOCKET.**—Hours, X.
- MISSOURIAN.**—Range, 350; system, Telefunken, 1000; hours, X. Notes, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- MOMUS.**—System, Marconi, 400.
- MONTANAN.**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- MULTNOMAH.**—Range, 150; system, Marconi, 120; W. L., 300, 600; service, PG; hours, N; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- NEBRASKAN.**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- NEVADAN.**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- NORTHERN PACIFIC.**—Range, 200; system, Marconi, 1000; service, PG; hours, N; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- NORTHLAND (WNX).**—Range, 150; system, Marconi, 120; W. L., 300, 600; service, PG; hours, N; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- NORTHWESTERN (KUO).**—Range, 200; system, Marconi, 480; service, PG; hours, X; rates, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram.
- NUSHAGAK.**—Range, 150; system, Marconi, 120; W. L., 300, 600; service, PG; hours, N; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Alaska Packers' Association, owner of vessel.
- NYACK.**—Strike out all particulars.
- OHIOAN.**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- OREGONIAN.**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- PACIFIC.**—Range, 200; system, composite, 1000.
- PANAMA (KMH).**—Note, Radio station operated and controlled by the Panama Railroad Co., owner of vessel.
- PANAMAN.**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- PENNSYLVANIAN.**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- RED CROSS.**—Strike out all particulars.
- REDONDO.**—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Alaska Steamship Co., owner of vessel.
- REUCE.**—Strike out system. Note, Columbia River Packers' Association, owner of vessel.

- SANTA RITA.**—Strike out system. Note, United Steamship Co. (Union Oil Co.), owner of vessel.
- SEGURANCA.**—System, Marconi, 480; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- SHEBOYGAN.**—Range, 150; system, Marconi; W. L., 300, 600; service, PG; hours, X; rate, 2 c. (0.10 fr.) per word, 20 c. (1 fr.) minimum per radiogram.
- SHENANGO (WET).**—Range, 150; system, Marconi, 120; rate, 2 c. (0.10 fr.) per word, 20 c. (1 fr.) minimum per radiogram.
- S. O. Co. No. 91.**—Range, 150; system, Marconi, 120; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- S. O. Co. No. 93.**—Range, 150; system, Marconi, 120; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- S. O. Co. No. 95.**—Range, 100; system, Marconi, 120; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- ST. NICHOLAS.**—Strike out system. Note, Columbia River Packers' Association, owner of vessel.
- TEXAN.**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- THE HARVESTER.**—Range, 200; system, Marconi, 240; service, PG; hours, X.
- TRINIDADIAN.**—Range, 200; system, Marconi, 400; service, PG; hours, X; rate, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram.
- UNITED STATES.**—Range, 100; system, Marconi, 120; W. L., 300, 600; service, PG; hours, X; rate, 2 c. (0.10 fr.) per word, 20 c. (1 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Indiana Transportation Co., owner of vessel.
- VESTA (KTS).**—Range, 200; system, Marconi, 480; service, PG; hours, X; rates, North and South American service, 4 c. (0.20 fr.) per word, 40 c. (2 fr.) minimum per radiogram, transoceanic service, 8 c. (0.40 fr.) per word, 80 c. (4 fr.) minimum per radiogram.
- VIRGINIA (WFH).**—Range, 150; system, Marconi, 120; hours, X.
- VIRGINIAN (WKV).**—Note, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- WARRIOR.**—Name, Wayfarer. Note, Alfred G. Vanderbilt, owner of vessel (yacht).
- WILLIAM P. SNYDER.**—Range, 150; system, Marconi-United, 120.
- WILPEN.**—Range, 150; system, Marconi, 120; W. L., 300, 600; service, PG; hours, X; rate, 2 c. (0.10 fr.) per word, 20 c. (1 fr.) minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Shenango Steamship Co., owner of vessel.
- WM. F. HERRIN.**—System, Marconi, 240.
- YALE.**—Range, 150.
- ZAPORA.**—System, Kilbourne & Clark. Note, International Fisheries Co., owner of vessel.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KYW, read: Wayfarer (b); WNF, read: Hattie Luckenbach (b). Strike out particulars following the call signals KNE, KRL, KRX, WEJ, and WEL.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the list of Radio Stations of the United States, edition of July 1, 1914, only.]

CAMBRIDGE, MASS. (1XP).—W. L., 300, 600, variable.

MEMPHIS, TENN. (5ZD).—W. L., 296.

MISCELLANEOUS.**SPECIAL SERVICE.**

The attention of owners and operators of commercial radio stations is invited to the Laws and Regulations, page 54, paragraphs 49 and 50. General public service may be defined as paid business between coast and ship or ship and ship stations, on the wave lengths of 300, 600, or 1,800 meters, conducted at a speed of not less than 20 words per minute. All special service, such as limited public service or other point-to-point communication, and all press items, must be conducted on some authorized wave length, not interfering with general public service.

STATION LICENSES.

Applications for station licenses (Form 761) must be submitted in the name of the person, company, or corporation controlling and operating the radio station and responsible under the law for the operation and for the radio accounts. The applications must be signed by the applicant or by an officer of the company or corporation.

TRANSMISSION OF TIME SIGNALS BY NAVAL RADIO STATIONS.

The transmission of time signals to vessels at sea by means of radiotelegraphy was first accomplished in the United States in 1905, and this service, enlarged and extended, has continued to the present time. This service is of the greatest value to mariners, as it furnishes a means by which the time, as given by the transmitted signals, may be compared with a ship's chronometer and the error of the chronometer found. Similar comparisons over a number of days enable data to be obtained by which not only the error may be found, but also the chronometer rate; that is, the rate at which it is gaining or losing.

The noontime signals on the Atlantic coast are sent out through the coast radio stations by connection with Western Union telegraph lines from the United States Naval Observatory at Washington, D. C. By the operation of proper relays in electrical circuits, the beats of the seconds of a standard clock in the observatory are sent out broadcast as a series of radio dots, commencing five minutes before the time of the final signal. By omitting certain dots in a series, the comparison between the dots and the beats of the chronometer seconds can be checked until the instant of local noon (seventy-fifth meridian time) is reached. This is marked by a longer dot, which gives the time of exact noon. A comparison with the chronometer time at that instant gives its error referred to the seventy-fifth meridian time. Applying the difference in longitude, namely, five hours, between the seventy-fifth meridian and Greenwich, which is the standard meridian (or 0° longitude), the error of the chronometer referred to Greenwich time is determined.

Time signals are now sent out on the Atlantic coast only through the radio stations at Arlington, Key West, and New Orleans. Signals from Arlington, which reach a zone formerly served by other coast stations, are sent out every day in the year twice a day, viz, at noon and 10 p. m., seventy-fifth meridian time. Time signals from

Key West and New Orleans are sent out daily, including Sundays and holidays, commencing at 11.55 a. m., seventy-fifth meridian time, and ending at local noon.

In case of failure of the Arlington high-power station, the signals are sent out by the small set in the same station, and the stations at Boston, Newport, Norfolk, and Charleston are notified, and they each send the signals broadcast.

On the Pacific coast the time signals are sent broadcast to sea through the naval radio stations at Mare Island, Eureka, and San Diego, Cal., and at North Head, Wash. The controlling clock for each station is in the naval observatory at the Mare Island Navy Yard. Signals from Mare Island are sent out every day from 11.55 to noon, and from 9.55 to 10 p. m., one hundred and twentieth meridian standard time. Those from North Head, Eureka, and San Diego are sent out daily, excluding Sundays and holidays, from 11.55 to noon, one hundred and twentieth meridian standard time.

To get the maximum clearness of signals, the receiving circuit should be tuned to that of the sending station. Arlington and Mare Island send on a 2,500-meter wave length, North Head and San Diego on a 2,000-meter wave length, Eureka on a 1,400-meter wave length, and Key West and New Orleans on a 1,000-meter wave length. On the completion of the new radio station at the training station, Great Lakes, time signals will be transmitted from that station for the benefit of shipping on the Great Lakes, as well as the weather reports for that region, now transmitted by Arlington after the Atlantic coast weather bulletin, following the 10 p. m. time signals.

RENEWAL OF STATION AND OPERATOR LICENSES.

Applicants for renewal of station and operator licenses must submit the originals of old licenses with application for renewal of same. Operators should be sure to have their service records on the backs of their licenses complete at all times, giving the time of service at all stations at which they are employed.

OPERATOR'S LICENSE SUSPENDED.

A commercial operator recently applied to the examining officer at the Philadelphia Navy Yard for a renewal of his first-grade license, and upon examination of his expired license it was found that the service record on the reverse side contained a fraudulent entry.

The operator has been severely reprimanded by the Secretary of Commerce, through the examining officer at the Philadelphia Navy Yard, and his license has been suspended for a period of three months.

COMMERCIAL OPERATOR REPRIMANDED.

The attention of all operators is invited to the Laws and Regulations, page 74, paragraph 210, regarding the use of profane or obscene words in radio communication. Several cases of violations of this regulation have been reported to the Bureau recently. An operator, reported by the radio inspector of the first district, for abbreviating messages in a reprehensible manner, was severely reprimanded by the Secretary of Commerce, and future violations may be subject to more drastic action.

AMATEUR PENALIZED.

An amateur of Portland, Me., was reported recently for operating a station in that city without a license. Judge Hale of the district court of Portland found the amateur guilty and imposed a fine.

RATES.

The rate of 42 cents per word for radiograms transmitted to vessels at sea, at a distance of 400 miles, authorized for the South Wellfleet station of the Marconi Wireless Telegraph Co. of America, was made effective on November 12, 1914. The increase in the ship rates from 2 cents to 4 cents per word and the coast rate from 3 cents to 6 cents per word, authorized for the Pacific stations of the Marconi Wireless Telegraph Co. of America for the North and South American service, was made effective on February 1, 1915.

AMENDMENTS.

[To be cut out and pasted in your copy.]

The Radio Communication Laws of the United States, edition of July 27, 1914, are hereby amended as follows:

Paragraph 153, page 66, should read:

Renewal licenses may be issued to commercial grade operators without examination, provided the service records on the backs of licenses properly certify to three months' satisfactory commercial service during the last six months of the license term. If expired licenses have been lost or destroyed, an affidavit must be submitted attesting the facts regarding the manner in which the license was lost. In such cases, evidence of the required satisfactory commercial service may be submitted in the form of letters, signed by masters and employers.

Operators holding licenses of grades other than commercial, who submit satisfactory evidence to the examining officer, showing actual operation of radio apparatus for three months during the last six months of the license term, may be issued new licenses without examination. Otherwise, applicants for renewals will be examined in the usual manner.

Renewals or new licenses may be issued a reasonable length of time previous to the expiration of existing licenses, but must bear the exact date of issue, which must correspond with the date on the back of Form 756 forwarded to the Commissioner of Navigation.

Service records must be completed and signed only by masters, employers, or the duly authorized agents of either.

Any improper alteration of the service record, or the forgery of masters' or employers' signatures, constitute a violation of the regulations, and the operator may suffer suspension of license for a period not exceeding one year, at the discretion of the Secretary of Commerce.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, May, 1915—No. 5.

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, January 14, 1916.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instructions, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the list of Radio Stations of the United States, and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the list of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the list of Radio Stations of the United States and the list of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:

E. F. SWEET,
Acting Secretary.

ABBREVIATIONS.**INTERNATIONAL ABBREVIATIONS USED IN THIS LIST.****Nature of service:**

PG=General public.

PR=Limited public or limited commercial.

P=Private.

O=Government business exclusively.

Hours of operation:

N=Continuous service.

X=No regular hours.

m=a. m.

s=p. m.

12 m=Midday.

12 s=Midnight.

c.=Cents.

OTHER ABBREVIATIONS.

Name =Name of station.

G. loc. =Geographical location (O=west longitude, N=north latitude).

Call =Radio call letters.

System=Radio system used and sparks per second.

Range =Normal range in nautical miles.

W. L. =Wave lengths.

Service=Nature of service.

Hours =Hours of operation.

Rates =Ship or coast charges in cents. (The rates in the international list are stated in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

Notes =Refers to notes in the Berne list.

Co. =Company.

NEW STATIONS.**LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.**

[Additions to the list of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Longitude and latitude (approximate).	Call signal.	Range.	System.	Wave lengths.
Canton, Ohio * ¹	O 81 22 00 N 40 48 00	WQP	100	.....	500
Denver, Colo.* ²	O 105 00 00 N 39 45 00	KIX	100	.....	600
Kvichak River, Alaska * ³	O 156 37 50 N 59 05 45	KML	20-30	Composite, 1000...	300, 500, 600
Lents, Oreg.* ⁴	O 122 35 00 N 45 23 00	KFU	.....	Poulsen arc.....	.....
Mount Vernon, Ohio * ⁵	O 82 31 00 N 40 24 00	WQV	80-90	.....	500
Naknek, Alaska (KMK) * ⁶	O 156 25 00 N 58 43 20	KMK	300	Composite.....	300, 500, 600
Ugashik, Alaska * ⁷	O 157 35 00 N 57 34 28	KMU	50-70	Composite, 400....	300, 500, 600

*The station has private service, with no regular hours.

¹ Radio station operated and controlled by Henry L. Ley. The station is limited to correspondence with a station at Mount Vernon, Ohio.² Radio station operated and controlled by William H. Smith. The station is limited to correspondence with a station of the Ajax Gold Mining Co., Victor, Colo.³ Radio station operated and controlled by the North Alaska Salmon Co. The station is limited to correspondence with ship and shore stations of the North Alaska Salmon Co.⁴ Radio station operated and controlled by the Federal Telegraph Co.⁵ Radio station operated and controlled by Bunyan J. Hyatt. The station is limited to correspondence with a station at Canton, Ohio.⁶ Radio station operated and controlled by the Naknek Packing Co.⁷ Radio station operated and controlled by the Red Salmon Canning Co. The station is limited to correspondence with stations of the Naknek Packing Co.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the list of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name.	Call signal.	System.	Wave lengths.	Service.	Hours.
Columbine ¹	NLL	U. S. Bureau of Standards, 1000.	600, 750, 1000	O	X
Cypress ¹	NLM	do.	600, 750, 1000	O	X
Dolphin (WAU) ^{2, 3}	WAU	Kilbourne & Clark.	300, 600		
Expansion ⁴	WOH	Composite, 100.	300, 500, 600	P	X
Gulfoast ^{5, 6}	KUE	Marconi.	300, 600		
Jim Butler ⁷	WIL	do.			
Nokomis ⁸	WCW				
Northwestern (WAN) ^{2, 3}	WAN	Kilbourne & Clark.	300, 600		
Portland ^{6, 9}	WNV	Kilbourne & Clark, 120.	300, 600	PG	X
Ramos ¹⁰	KER	Fessenden.	300, 600		
Seantor Bailey ^{3, 11}	KGS	Composite, 350.	300, 600	PG	
Southerner ^{6, 12}	KJF	Marconi.	300, 600	PG	
Sultana ¹³	KZH	do.			
Wapama ¹⁴	WMG	do.			

¹ Radio station operated and controlled by the United States Department of Commerce, Bureau of Lighthouses.

² Alaska Steamship Co., owner of vessel.

³ Rates, 4 c. per word, 40 c. minimum per radiogram.

⁴ Radio station operated and controlled by the North Alaska Salmon Co., owner of vessel.

⁵ Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Gulf Refining Co., owner of vessel.

⁶ Rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.

⁷ Olson & Mahony, owner of vessel.

⁸ Horace E. Dodge, owner of vessel (yacht).

⁹ The station has a range of 300 miles. Radio station operated and controlled by the Nynco Line (Inc.), owner of vessel.

¹⁰ Sloan, Dannenhower Co., owner of vessel.

¹¹ The station has a range of 200 miles. Radio station operated and controlled by the Steele Towing & Wrecking Co., owner of vessel.

¹² Walker, Armstrong & Co., owner of vessel.

¹³ Mrs. Mary W. Harriman, owner of vessel (yacht).

¹⁴ Charles R. McCormick & Co., owner of vessel.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b—ship station; o—land station.]

Call signal.	Station.	Call signal.	Station.
KER	Ramos.....b	NLM	Cypress.....b
KFU	Lents, Ore.....c	WAN	Northwestern.....b
KGS	Senator Bailey.....b	WAU	Dolphin.....b
KIX	Denver, Colo.....c	WCW	Nokomis.....b
KJF	Southerner.....b	WIL	Jim Butler.....b
KMK	Naknek, Alaska.....c	WMG	Wapama.....b
KML	Kvichak River, Alaska.....c	WNV	Portland.....b
KMU	Ugashik, Alaska.....c	WOH	Expansion.....b
KUE	Gulfoast.....b	WQP	Canton, Ohio.....c
KZH	Sultana.....b	WQV	Mount Vernon, Ohio.....c
NLL	Columbine.....b		

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the list of radio stations of the United States, edition of July 1, 1914, only.]

Station.	Call signal.	Wave lengths.	Serv-ice.	Hours.	Station controlled by—
Fargo, N. Dak.....	9YF	300, 600.....	P	X	Theo. L. Wanner.
Hartford, Conn. (1ZT).....	1ZT	200, 425.....	P	7s-11s	Clarence D. Tuska.
Montauk, Long Island, N. Y.....	2XE	300, 600, variable.....	P	X	Western Electric Co.
New Castle, Pa.....	8ZN	200, 425.....	P	X	R. L. Patch.
New York, N. Y. (2XR).....	2XR	Variable.....	P	X	Marconi Co.
Orono, Me.....	1XK	280, 590, 800.....	P	X	University of Maine.
Rock Island, Ill.....	9XR	500.....	P	X	Robert K. Karlowa and Ray E. Hall (Tri-City Radio Laboratory).
Schenectady, N. Y. (2XI).....	2XI	1600 to 10,000, variable.....	P	X	General Electric Co.
Warren, Ohio.....	8XW	1800.....	P	X	Goodyear Tire & Rubber Co.
Wichita, Kans.....	9YE	1700.....	P	X	Walter S. Ezell.

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
1XK	First district:		
1ZT	Orono, Me.....	8XW	Eighth district:
	Hartford, Conn.....	8ZN	Warren, Ohio.
			New Castle, Pa.
2XE	Second district:	9XR	Ninth district:
2XI	Montauk, Long Island, N. Y.....	9YE	Rock Island, Ill.
2XR	Schenectady, N. Y.....	9YF	Wichita, Kans.
	New York, N. Y.....		Fargo, N. Dak.

ALTERATIONS AND CORRECTIONS.**LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.**

[Alterations and corrections to be made to the list of radio stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

AKRON, OHIO.—G. loc. (approximate) O 81° 40' 00", N. 41° 10' 00"; range, 350; system, Composite, 300-960; W. L., 300, 600, 2070; hours, 8m-4.30s; rate, 2½ c. per word, 25 c. minimum per radiogram. Notes, Radio station operated and controlled by the Goodyear Tire & Rubber Co. The station is limited to correspondence with the station of the Goodyear Tire & Rubber Co. at Detroit, Mich.

BOSTON (NAD), MASS.—Strike out note regarding time signals.

CHARLESTON, S. C.—Strike out note regarding time signals.

DETROIT (WOK), MICH.—G. loc. (approximate) O 83° 10' 00", N. 42° 20' 00"; range, 300; system, Composite, 300 and 600; W. L., 300, 600, 2070; hours, 8.30m-4.30s; rate, 2½ c. per word, 25 c. minimum per radiogram. Notes, Radio station operated and controlled by the Goodyear Tire & Rubber Co. The station is limited to correspondence with the station of the Goodyear Tire & Rubber Co. at Akron, Ohio.

EUREKA (NPW), CAL.—Notes, Radio station operated and controlled by the United States Naval Radio Service, Radio, Va. The station sends time signals daily at noon (time of the meridian 120° west of Greenwich), Sundays and holidays excluded, on the wave length of 1600 meters. Signals same as for Arlington, Radio, Va. Time furnished by Observatory at Navy Yard, Mare Island, Cal.

KAHUKU, HAWAII.—Name, Wahiawa; strike out G. loc. range, 300; system, Marconi-Massie, 600; W. L., 300, 600.

KEY WEST, FLA.—Notes, Radio station operated and controlled by the United States Naval Radio Service, Radio, Va. The station sends time signals daily at noon (time of the meridian 75° west of Greenwich), Sundays and holidays included, on the wave length of 1500 meters. Signals same as for Arlington, Radio, Va. Time furnished by Naval Observatory at Washington, D. C.

- MARE ISLAND, CAL.**—Notes, Radio station operated and controlled by the United States Naval Radio Service, Radio, Va. The station sends time signals twice daily for five minutes on a wave length of 1600 meters, commencing at 11.55m and 9.55s, Sundays and holidays included. Final signals at 12m and 10s (time of the meridian 120° west of Greenwich). Signals same as for Arlington, Radio, Va. Time furnished by Observatory at Navy Yard, Mare Island, Cal.
- NEWPORT (NAF), R. I.**—Strike out note regarding time signals.
- NORFOLK, VA.**—Strike out note regarding time signals.
- PORT ROYAL, S. C.**—G. loc., O 80° 41' 00'', N. 32° 22' 00''.
- SEA GATE, N. Y.**—System, Marconi, 120 and 420.
- TATOOSH, WASH.**—Strike out note regarding time signals.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

Alterations and corrections to be made to the list of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

- ADMIRAL DEWEY.**—Strike out range; system, Kilbourne & Clark. Note, Radio station operated and controlled by the Pacific-Alaska Navigation Co., owner of vessel.
- ADMIRAL FARRAGUT.**—Strike out range; system, Kilbourne & Clark; W. L., 300, 600. Note, Radio station operated and controlled by the Pacific-Alaska Navigation Co., owner of vessel.
- ADMIRAL SCHLEY.**—Strike out range; system, Kilbourne & Clark. Note, Radio station operated and controlled by the Pacific-Alaska Navigation Co., owner of vessel.
- ADVENTURESS.**—Strike out all particulars.
- BELUGA.**—Strike out all particulars.
- BERTHA.**—Strike out all particulars.
- BRILLIANT (KTI).**—System, Marconi, 1000.
- BUENAVENTURA.**—Range, 200; system, Marconi, 480; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- CALIFORNIAN (WKC).**—Range, 200; hours, 9m–12m, 2s–5s, 8s–10.30s; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.
- CAMAGUEY.**—Range, 200; system, Marconi, 400; service, PG; hours, N; rate, 4 c. per word, 40 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. New York and Cuba Mail Steamship Co. (Ward Line), owner of vessel.
- CHARLES E. HARWOOD.**—Range, 200; system, Marconi, 300; service, PG; hours, X.
- CITY OF TOPEKA.**—System, Marconi, 400.
- COL. E. L. DRAKE.**—System, Marconi, 120; W. L., 300, 600; service, PG.
- COLORADO (KEA).**—Range, 200; system, Marconi, 120; W. L., 300, 600; service, PG; hours, N; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Mallory Steamship Co., owner of vessel.
- C. W. MORSE.**—Range, 150; system, Marconi, 400; rate, 4 c. per word, 40 c. minimum per radiogram.
- DENVER (KED).**—Strike out all particulars.
- EDWARD L. DOHENY.**—Range, 150; system, Marconi, 300; service, PG; hours, X.
- GEO. W. ELDER.**—Range, 200; system, Marconi, 120; W. L., 300, 600; service, PG; hours, N; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- GRACE DOLLAR.**—Strike out range; strike out system. Note, Grace Dollar Steamship Co., owner of vessel.
- HONOLULAN.**—System, Marconi, 480.
- ILLINOIS (KTH).**—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG; hours, X; rates, North and South American service; 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Texas Steamship Co., owner of vessel.
- INDEPENDENT.**—Strike out system; strike out rates. Note, National Independent Fisheries Co., owner of vessel.

- J. A. CHANSLOR.**—Range, 200; system, Marconi, 120; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- J. A. MOFFETT.**—Range, 150; system, Marconi, 1000; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- J. M. GUFFEY.**—System, Marconi, 240; hours, X.
- JOHN D. ARCHBOLD.**—Range, 200; system, Marconi, 240; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of New Jersey, owner of vessel.
- LARIMER.**—System, Marconi, 240; hours, X.
- LYDONIA.**—Range, 150; system, Marconi, 500; W. L., 300, 600; service, PG; hours, X; rate, 2 c. per word, 20 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. W. A. Lydon, owner of vessel (yacht).
- MATSONIA.**—System, Marconi, 480.
- MEXICANO.**—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG; hours, X; rate, 4 c. per word, 40 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Pierce Oil Corporation, owner of vessel.
- MOHAWK (KXE).**—System, Fessenden, 260; W. L., 300, 550, 600.
- MOHEGAN.**—System, Fessenden, 260; W. L., 300, 550, 600.
- NECHES.**—Range, 200; system, Marconi, 240; service, PG; hours, X; rates, 4 c. per word, 40 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Mallory Steamship Co., owner of vessel.
- NORMAN BRIDGE.**—Range, 200; system, Marconi, 300; service, PG; hours, X.
- NORTH LAND (KJD).**—System, Marconi, 400.
- NUSHAGAK.**—Strike out system. Note, Alaska Packer's Association, owner of vessel.
- PARAISO.**—Range, 150; system, Marconi, 240; hours, N; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Craig Shipbuilding Co., owner of vessel.
- PEQUONNOCK.**—System, Fessenden, 260; W. L., 300, 550, 600.
- PERFECTION.**—Range, 200; system, Marconi, 1000; service, PG; hours, X. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of New York, owner of vessel.
- PILOT BOY.**—Range, 100; system, Marconi, 400; service, PG; hours, 8m–11m, 2s–5s, 7s–8s; rates, 4c. per word, 40 c. minimum per radiogram.
- PLATURIA.**—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Oil Co. of New Jersey, owner of vessel.
- PLYMOUTH.**—W. L., 300, 550, 600.
- PRINCETON (KST).**—Note, Standard Oil Co. of New Jersey, owner of vessel.
- PROVIDENCE.**—W. L., 300, 550, 600.
- RADIANT.**—Range, 200; system, Marconi, 1000; service, PG; hours, X.
- REDONDO.**—Strike out range; strike out system; strike out hours. Note, Alaska Steamship Co., owner of vessel.
- ROBERT DOLLAR.**—Strike out all particulars.
- SANTA CRUZ (WBD).**—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- SANTA MARIA (WTF).**—Strike out range; system, Poulsen arc; strike out rates. Note, United Steamship Co. (Union Oil Co.), owner of vessel.
- SANTA ROSALIA.**—Range, 200; system, Marconi, 480; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- SANTIAGO.**—Range, 200; system, Marconi, 400; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. New York & Cuba Mail Steamship Co. (Ward Line), owner of vessel.

SATILLA.—Range, 200; system, Marconi, 120; W. L., 300, 600; service, PG; hours, X; rates, 4 c. per word, 40 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Atlantic, Gulf, and West Indies Steamship Lines, owner of vessel.

SHEBOYGAN.—Strike out all particulars.

SOMERSET (KSU).—Note, Standard Oil Co. of New Jersey, owner of vessel.

STANLEY DOLLAR.—Strike out system. Note, Dollar Steamship Line, owner of vessel.

STARR.—System, Kilbourne & Clark. Note, Radio station operated and controlled by the San Juan Fishing and Packing Co., owner of vessel.

ST. FRANCIS.—Strike out system; strike out rates. Note, Libby, McNeill & Libby, owner of vessel.

ST. HELENS.—System, Marconi, 120; W. L., 300, 600; service, PG.

ST. LOUIS (KSL).—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG; hours, N; rates, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. International Mercantile Marine Co. (American Line), owner of vessel.

TARRAGON.—Strike out all particulars.

UNITED STATES.—Strike out all particulars.

VENETIA.—System, Marconi. Note, Radio station operated and controlled by J. D. Spreckels, owner of vessel (yacht).

W. R. FLINT.—Strike out system; strike out rates. Note, Libby, McNeill & Libby, owner of vessel.

WILD DUCK.—Range, 150; system, Marconi, 400; W. L., 300, 600; service, PG; hours, X; rate, 4 c. per word, 40 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Gulf Refining Co., owner of vessel (yacht).

WILLAMETTE.—Range, 150; system, Marconi, 120; W. L., 300, 600; service, PG; hours, N; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram.

W. S. PORTER.—Range, 150; system, Marconi, 120; W. L., 300, 600; service, PG.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KHK, read: Wahiawa, Hawaii (c). Strike out particulars following the call signals KED, KYV, NZZ, WBR, WFL, WIT, WLB, and WSM.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the list of Radio Stations of the United States, edition of July 1, 1914, only.]

MEMPHIS, TENN. (5XC).—W. L., 425 variable to 600.

PITTSFIELD, MASS.—W. L., 600, 1600 variable to 6000.

TAKOMA PARK, MD.—W. L., 500, 2000.

MISCELLANEOUS.

TRANSMISSION OF WEATHER REPORTS BY NAVAL RADIO STATIONS.

Through cooperation with local offices of the United States Weather Bureau, weather forecasts are sent broadcast to sea through naval coast radio stations at certain times, varying with the locality. Coast stations are generally prepared to give local forecasts to passing vessels without charge, on request. Storm warnings are sent whenever received and the daily weather bulletins are distributed by the naval radio stations at Arlington, Va., and Key West, Fla., a few minutes after the 10 p. m. time signal. These bulletins consist of two parts.

The first part contains code letters and figures which express the actual weather conditions at 8 p. m., seventy-fifth meridian time, on the day of distribution, at certain points along the eastern coast of North America, one point along the Gulf of Mexico, and one at Bermuda.

The second part of the bulletin contains a special forecast of the probable winds to be experienced a hundred miles or so off shore, made by the United States Weather Bureau, for distribution to shipmasters. The second part of the bulletin also contains warnings of severe storms along the coasts, as occasions for such warnings may arise.

Immediately following this bulletin, a weather bulletin for certain points along the Great Lakes is sent broadcast by the naval radio station at Arlington, Va., consisting of two parts. The first part contains code letters and figures which express the actual weather conditions at 8 p. m., seventy-fifth meridian time, on the day of distribution, at certain points along the Lakes. The second part of the bulletin contains a special forecast of the probable winds to be experienced on the Lakes, during the season of navigation—about April 15 to December 10.

The points for which weather reports are furnished are designated as follows: *For Atlantic coast and Gulf points*, S = Sydney, T = Nanucket, DB = Delaware Breakwater, H = Hatteras, C = Charleston, K = Key West, P = Pensacola, and B = Bermuda; *for points on the Great Lakes*, Du = Duluth, M = Marquette, U = Sault Ste. Marie, G = Green Bay, Ch = Chicago, L = Alpena, D = Detroit, V = Cleveland and F = Buffalo.

All bulletins begin with the letters U. S. W. B. (United States Weather Bureau) and the weather conditions follow. The first three figures of a report represent the barometric pressure in inches (002 = 30.02); the next figure, the fourth in sequence, represents the direction of the wind to the eight points of the compass: 1 = north, 2 = northeast, 3 = east, 4 = southeast, 5 = south, 6 = southwest, 7 = west, 8 = northwest and 0 = calm. The fifth figure represents the force of the wind on the Beaufort Scale, given below.

BEAUFORT SCALE OF WIND FORCE.

Number and designation.	Statute miles per hour.	Nautical miles per hour.
0 Calm.....	0 to 3	0 to 2.6
1 Light air.....	8	6.9
2 Light breeze.....	13	11.3
3 Gentle breeze.....	18	15.6
4 Moderate breeze.....	23	20.0
5 Fresh breeze.....	28	24.3
6 Strong breeze.....	34	29.5
7 Moderate gale.....	40	34.7
8 Fresh gale.....	48	41.6
9 Strong gale.....	56	48.6
10 Whole gale.....	65	56.4
11 Storm.....	75	65.1
12 Hurricane.....	90 and over.	78.1 and over.

In order to simplify the code, no provision has been made for wind force greater than 9, strong gale, on the Beaufort Scale. Whenever winds of force greater than 9 occur, the number representing them is given in words instead of figures, thus: Ten, eleven, etc.

EXAMPLES OF CODE.

U S W B S 96465 T 91674 DB 94686 H 99886 C 01214
K 02622 P 03613 B 00065

Translation.

United States Weather Bureau.

Station.	Pressure.	Wind.	
		Direction.	Force. ¹
Sydney.....	29.64	SW	5
Nantucket.....	29.16	W	4
Delaware Breakwater.....	29.46	NW	6
Hatteras.....	29.98	NW	6
Charleston.....	30.12	N	4
Key West.....	30.26	NE	2
Pensacola.....	30.36	N	3
Bermuda.....	30.00	SW	5

¹ See Beaufort Scale.

U S W B Du 95826 M 97635 U 00443 G 96046 Ch 95667
L 00644 D 00842 V 01054 F 01656

Translation.

United States Weather Bureau.

Station.	Pressure.	Wind.	
		Direction.	Force. ¹
Duluth.....	29.58	NE	6
Marquette.....	29.76	E	5
Sault Ste. Marie.....	30.04	SE	3
Green Bay.....	29.60	SE	6
Chicago.....	29.56	SW	7
Alpena.....	30.06	SE	4
Detroit.....	30.08	SE	2
Cleveland.....	30.10	S	4
Buffalo.....	30.16	S	6

¹See Beaufort scale.

NOTICE RELATIVE TO HANDLING OF OFFICIAL RADIOGRAMS BY NAVAL RADIO SERVICE.

When radiograms from ships other than naval vessels relating to official business of the United States (those having the word "Govt." preceding the address) are forwarded through naval radio shore stations, they will be transferred to forwarding lines without any further attempt to relay. These "Govt." messages include those addressed to the Weather Bureau or Observer.

In the case of all "Govt." messages originating on ships, Government or otherwise, in Alaskan waters, forwarded through naval radio shore stations, destined to points in the United States, they will be relayed by naval radio to North Head if for points outside of California, or to Eureka if for points in California, and there transferred to forwarding lines. The preceding applies where no routing instructions are given, but messages will be routed otherwise if so directed by the station of origin.

No charges will be made by the Naval Radio Service for the transmission of these "Govt." messages, but it will in all cases look to the station of origin for all forwarding charges at Government rates.

RADIO-SERVICE PERSONNEL.

V. Ford Greaves, radio engineer of the Bureau, is making a tour of inspection of the Pacific-coast districts.

Harry Sadenwater, of New York City, has been appointed as an assistant radio inspector in the office of the chief radio inspector at that port.

George B. MacMahon, clerk in the New York office, has been granted six months' leave without pay, on account of ill health, and is now on the Pacific coast.

CHANGE IN ARMY RATES.

The following changes in the ship and coast radio charges of the United States Army Radio Service, approved by the Secretary of War, will become effective on July 1, 1915:

The radio rate for stations of the United States Army Radio Service is six cents per word for shore stations and four cents per word for ship stations, ten-word minimum.

The charge, where the radio service is performed wholly between Army ship and shore stations, is, therefore, ten cents per word, and between two Army ship stations, eight cents per word.

COMMERCIAL EXTRA FIRST-GRADE OPERATORS.

The names of the following operators have been added to the list of those to whom commercial extra first-grade licenses have been issued by the Secretary of Commerce, as a reward for long and efficient service: Leo. F. Whitehead, Boston, Mass., and Walter John Lynch, New York, N. Y.

AMENDMENTS.

[To be cut out and pasted in your copy.]

The Radio Communication Laws of the United States, edition of July 27, 1914, are hereby amended as follows:

Paragraph 153, page 66, should read:

a. Renewal licenses may be issued to commercial grade operators without examination, provided the service records on the backs of licenses properly certify to three months' satisfactory commercial service during the last six months of the license term. If expired licenses have been lost or destroyed, an affidavit must be submitted attesting the facts regarding the manner in which the license was lost. In such cases, evidence of the required satisfactory commercial service may be submitted in the form of letters, signed by masters and employers.

b. Operators holding licenses of grades other than commercial, who submit satisfactory evidence to the examining officer, showing actual operation of radio apparatus for three months during the last six months of the license term, may be issued new licenses without examination. Otherwise, applicants for renewals will be examined in the usual manner.

c. Renewals or new licenses may be issued a reasonable length of time previous to the expiration of existing licenses, but must bear

the exact date of issue, which must correspond with the date on the back of Form 756 forwarded to the Commissioner of Navigation.

d. Operators who fail to apply for renewal of their licenses on or prior to the date of expiration must be reexamined. If, because of circumstances over which the applicant has no control, an operator is unable to apply for renewal of license on or prior to the date of expiration, an affidavit may be submitted to the Commissioner of Navigation through the radio inspector or examining officer, attesting to the facts, which will be considered by the Commissioner of Navigation, who will advise the radio inspector or examining officer in regard to the issue of a renewal of the license without reexamination.

e. Service records must be completed and signed only by masters, employers, or the duly authorized agents of either.

f. Any improper alteration of the service record, or the forgery of masters' or employers' signatures, constitute a violation of the regulations, and the operator may suffer suspension of license for a period not exceeding one year, at the discretion of the Secretary of Commerce.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, June, 1915—No. 6

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the list of Radio Stations of the United States, and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the list of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the list of Radio Stations of the United States and the list of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:

E. F. SWEET,
Acting Secretary.

ABBREVIATIONS.

INTERNATIONAL ABBREVIATIONS USED IN THIS LIST.

Nature of service:

PG=General public.

PT=Limited public.

P=Private.

O=Government business exclusively.

Hours of operation:

N=Continuous service.

X=No regular hours.

m=a. m.

s=p. m.

12 m=Midday.

12 s=Midnight.

c.=Cents.

OTHER ABBREVIATIONS.

Name =Name of station.

G. loc. =Geographical location (O=west longitude, N=north latitude).

Call =Radio call letters.

System=Radio system used and sparks per second.

Range =Normal range in nautical miles.

W. L. =Wave lengths.

Service=Nature of service.

Hours =Hours of operation.

Rates =Ship or coast charges in cents. (The rates in the international list are stated in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

Notes =Refers to notes in the Berne list.

Co. =Company.

NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the list of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Longitude and latitude (approximate).	Call signal.	Range.	System.	Wave lengths.
Akutun, Alaska ¹.....	.....	KMW	.....	.....	.....
Albina, Oreg. ².....	.....	KGN	.....	.....	.....
Egegak, Alaska ³ , ⁴	O 157 39 00	KMF	100-300	Composite, 300....	300, 600
Nushagak, Alaska (KMG) ³ , ⁴	N 58 17 00	.....	.....	.....	.....
.....	O 158 32 00	KMG	100-300	Composite, 300....	300, 600
.....	N 58 42 00	.....	.....	.....	.....
Roche Harbor, Wash. ⁵.....	.....	KRW	.....	.....	.....
Seattle, Wash. (KPE) ⁶ , ⁷	O 122 20 00	KPE	50	Composite, 150....	300, 525, 600
.....	N 47 37 00	.....	.....	.....	.....
Underwood, Wash. ².....	.....	KGO	.....	.....	.....

¹ Radio station operated and controlled by the North Pacific Sea Products Co.² Radio station operated and controlled by the North eastern Electric Co.³ The station has private service, with no regular hours.⁴ Radio station operated and controlled by the North Alaska Salmon Co. The station is limited to correspondence with ship and land stations of the North Alaska Salmon Co.⁵ Radio station operated and controlled by the Tacoma & Roche Harbor Lime Co.⁶ Service, 1 R; hours, 8m-5s, except Sundays and holidays.⁷ Radio station operated and controlled by the city of Seattle (harbor department). The station corresponds with the harbor patrol boats and all vessels entering Puget Sound.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the list of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berné bureau.]

Name.	Call signal.	System.	Wave lengths.	Service.	Hours.
Achilles.....	KPT		300, 600		
Costa Rica ^{1, 2, 3}	WQI	Composite, 480.....	300, 600	PG	N
Edith ^{2, 4, 5}	WAE	Kilbourne & Clark, 120.....	300, 600	PG	X
Matinicoek ⁶	KID		300, 600		
Restorer ^{4, 7, 8}	WIU	Marconi.....	300, 600	P	N
San Mateo ⁹	KLW		300, 600		
San Pablo ¹⁰	KLW		300, 600		
San Pedro ¹¹	KLX		300, 600		
Santa Catalina ^{4, 7, 12, 13}	WBC	Marconi, 480.....	300, 600	PG	X
Sarnia ^{7, 12, 14, 15}	KVR	Marconi, 240.....	300, 600	PG	N
Seward ^{2, 4, 5}	WAV	Kilbourne & Clark, 120.....	300, 600	PG	X
Sibiria ¹⁶	KVS	Marconi.....	300, 600		
Standard ⁶	KIC				
Victoria ^{2, 4, 5}	WAD	Kilbourne & Clark, 120.....	300, 600	PG	N

- ¹ Range, 500 miles.
² Rates, 4 c. per word, 40 c. minimum per radiogram.
³ Radio station operated and controlled by the Bristol Bay Packing Co., owner of vessel.
⁴ Range, 100 miles.
⁵ Radio station operated and controlled by the Alaska Steamship Co., owner of vessel.
⁶ Standard Oil Co. of New Jersey, owner of vessel.
⁷ Rates, North and South American service 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
⁸ Radio station operated and controlled by the Commercial Pacific Cable Co., owner of vessel.
⁹ San Mateo Steamship Corporation, owner of vessel.
¹⁰ San Pablo Steamship Corporation, owner of vessel.
¹¹ San Pedro Steamship Corporation, owner of vessel.
¹² Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.
¹³ Atlantic & Pacific Steamship Co., owner of vessel.
¹⁴ Range, 200 miles.
¹⁵ Sarnia Steamship Corporation, owner of vessel.
¹⁶ Sibiria Steamship Corporation, owner of vessel.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b—ship station; c—land station.]

Call signal.	Station.	Call signal.	Station.
KGN	Albina, Oreg.....c	KPT	Achilles.....b
KGO	Underwood, Wash.....c	KRW	Roche Harbor, Wash.....c
KIC	Standard.....b	KVR	Sarnia.....b
KID	Matinicoek.....b	KVS	Sibiria.....b
KLW	San Mateo.....b	WAD	Victoria.....b
KLX	San Pablo.....b	WAE	Edith.....b
KMF	San Pedro.....b	WAV	Seward.....b
KMG	Egegak, Alaska.....c	WBC	Santa Catalina.....b
KMW	Nushagak, Alaska.....c	WIU	Restorer.....b
KPE	Akutun, Alaska.....c	WQI	Costa Rica.....b
	Seattle, Wash.....c		

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the list of Radio Stations of the United States, edition of July 1, 1914, only.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Algona, Wash.....	7XU	300, 600, 4000 variable.	P	X	Universal High Power Telephone Co.
Grand Coteau, La.....	5ZQ	450.....	P	X	St. Charles College.
Ithaca, N. Y.....	8YC	300, 425.....	P	X	Cornell University.
Lawrence, Kans.....	9XP	400, 550, 800, variable.	P	X	University of Kansas.
Pittsburgh, Pa.....	8YI	300, 425.....	P	X	University of Pittsburgh.
Providence, R. I.....	12P	200, 300, 425, 600.....	P	X	Ralph C. Watrous.
Rockland, Me.....	12R	200, 300, 450, 600.....	P	X	Edward L. Norton.
Seattle, Wash. (7XK)...	7XK	600, 1000, 1400, 2000, 4000, variable.	P	X	Kilbourne & Clark Mfg. Co.
Seattle, Wash. (7XM)...	7XM	300, 600, 1400, variable.	P	X	Wireless Instrument Co.
Worcester, Mass.....	12W	200, 425.....	P	X	Wm. H. Allison.

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
1ZP	First district:	7XM	Seventh district—Continued:
1ZR	Providence, R. I.	7XU	Seattle, Wash.
1ZW	Rockland, Me.	8YC	Algona, Wash.
	Worcester, Mass.	8YI	Eighth district:
5ZQ	Fifth district:	9XP	Ithaca, N. Y.
	Grand Coteau, La.		Pittsburgh, Pa.
	Seventh district:		Ninth district:
7XK	Seattle, Wash.		Lawrence, Kans.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the list of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

ELLAMAR, ALASKA.—Strike out all particulars.

FRIDAY HARBOR, WASH.—Strike out all particulars.

JUALIN, ALASKA.—Strike out all particulars.

MARSHFIELD, OREG.—Range, 250; system, Marconi, 240; W. L., 300, 600.

NEWPORT (WCI), R. I.—Range, 75; system, Fessenden, 1000; W. L., 300, 550, 600; rates, vessels plying between ports within 200 miles of New York, N. Y., 3 c. per word, 30 c. minimum per radiogram; North and South American service, 6 c. per word, 60 c. minimum per radiogram; transoceanic service, 12 c. per word, \$1.20 minimum per radiogram.

NEW YORK (WHD), N. Y.—Strike out all particulars.

PASSAGRILLE, FLA.—Ship rate, 6 c. per word, cable count, no minimum.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the list of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

ADMIRAL DEWEY.—Range, 100; system, Kilbourne & Clark, 120.

ADMIRAL FARRAGUT.—Range, 100; system, Kilbourne & Clark, 120.

ADMIRAL SCHLEY.—Range, 100; system, Kilbourne & Clark, 120.

ADMIRAL WATSON.—Hours, N.

ALAMEDA.—Range, 100; system, Kilbourne & Clark, 120; rate, 4 c. per word, 40 c. minimum per radiogram. Note, Radio station operated and controlled by the Alaska Steamship Co., owner of vessel.

ALOHA.—Range, 200; system, Marconi, 1000; W. L., 300, 600; service, PG; hours, N; rate, 4 c. per word, 40 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Arthur Curtiss James, owner of vessel (yacht).

AMERICAN.—Hours, X.

ANTILLA.—Range, 200; system, Marconi, 400; service, PG; rate, 4 c. per word, 40 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. New York & Cuba Mail Steamship Co. (Ward Line), owner of vessel.

ATLANTIC CITY.—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG; rate, 4 c. per word, 40 c. minimum per radiogram.

BANTU.—Range, 200; system, Marconi, 400; service, PG; hours, X; rate, 4 c. per word, 40 c. minimum per radiogram.

BATON ROUGE.—Range, 200; system, Telefunken, 1000; service, PG; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Standard Oil Co. of New Jersey, owner of vessel.

BAYAMON.—Strike out all particulars.

BAYWAY.—Range, 200; system, Telefunken, 1000; service, PG; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Standard Oil Co. of New Jersey, owner of vessel.

- BELFAST.**—System, Marconi, 400.
- BERLIN.**—Range, 100; system, Marconi, 480; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- BEVERLY.**—Range, 50; system, Fessenden, 260; service, PG; hours, N; rate, 3 c. per word, 30 c. minimum per radiogram. Notes, Radio station operated and controlled by the National Electric Signaling Co. Colonial Navigation Co., owner of vessel.
- BORINQUEN.**—Strike out all particulars.
- BRABANT.**—System, Marconi, 240; rate, 4 c. per word, 40 c. minimum per radiogram.
- BROCKTON.**—Range, 50; system, Fessenden, 260; service, PG; hours, N; rate, 3 c. per word, 30 c. minimum per radiogram. Notes, Radio station operated and controlled by the National Electric Signaling Co. Colonial Navigation Co., owner of vessel.
- CALIFORNIA (KYQ).**—Range, 200; system, Marconi, 240; service, PG; hours, N; rate, 4 c. per word, 40 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Mrs. Clara B. Stocker, owner of vessel (yacht).
- CALORIA.**—Range, 200; system, Marconi, 480; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- CHARLTON HALL.**—Range, 200; system, Marconi, 240; service PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- CHICAGO (WAC).**—Range, 100; system, Kilbourne & Clark, 120; W. L., 300, 600; service, PG; hours, X.
- CHINA.**—System, Marconi, 120; W. L., 300, 600; service, PG. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Pacific Mail Steamship Co., owner of vessel.
- CHIPPEWA (WBH).**—Strike out all particulars.
- CITY OF MACON.**—Rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- CITY OF MEMPHIS.**—System, Marconi, 400; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- CITY OF PANAMA.**—Strike out all particulars.
- CITY OF SEATTLE.**—Range, 100; system, Marconi, 480; W. L., 300, 600; service, PG; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- COL. JAMES M. SCHOONMAKER.**—Strike out all particulars.
- COLUMBIA (WPW).**—Strike out all particulars.
- CRASTER HALL.**—Range, 200; system, Marconi, 240; service, PG; hours, X. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. U. S. Steel Products Co., owner of vessel.
- CROFTON HALL.**—Range, 200; system, Marconi, 120; service, PG; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- C. W. MORSE.**—Strike out all particulars.
- CYPRUS.**—Range, 200; system, Marconi, 1000; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- DAMARA.**—System, Marconi, 240.
- DELHI.**—Strike out all particulars.
- DESPATCH.**—Range, 150; system, Marconi, 240; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- DIRIGO.**—Strike out all particulars.
- DOLPHIN (WAU).**—Range, 100; system, Kilbourne & Clark, 120; service, PG; hours, N. Note, Radio station operated and controlled by the Alaska Steamship Co., owner of vessel.
- EVANGELINE.**—Range, 200; system, Marconi, 120; service, PG; hours, N; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- EXPLORER.**—Range, 150; system, Telefunken; hours, N. Notes, Radio station operated and controlled by the United States Department of Commerce, Coast and Geodetic Survey. Surveying ship.

- F. A. KILBURN.**—System, Marconi, 400.
- FORWARD (KPF).**—Range, 50; system, Fessenden, 260; W. L., 300, 450, 500, 550, 600; service, PG; hours, N; rate, 6 c. per word, 60 c. minimum per radiogram. Notes, Radio station operated and controlled by the National Electric Signaling Co. Yankee Salvage Association, owner of vessel.
- GENL. PETTIBONE.**—Strike out all particulars.
- GLORY OF THE SEAS.**—Strike out all particulars.
- GOLIAH.**—Range, 100; system, Kilbourne & Clark, 120; W. L., 300, 600; service, PG; hours, X; rate, 4 c. per word, 40 c. minimum per radiogram. Note, Radio station operated and controlled by the Puget Sound Tug Boat Co., owner of vessel.
- GOVERNOR DINGLEY.**—System, Marconi, 400.
- GRAYSON.**—Strike out all particulars.
- GUANTANAMO.**—Range, 200; system, Marconi, 400; service, PG; hours, N; rate 4 c. per word, 40 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. New York & Cuba Mail Steamship Co. (Ward Line) owner of vessel.
- GULFOIL.**—System, Marconi, 480; hours, X.
- HAWAIIAN.**—Range, 200; system, Telefunken, 1000; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- HOWICK HALL.**—Range, 200; system, Marconi, 240; service, PG; hours, N.
- HUMBOLDT.**—Range, 100; W. L., 300, 600; service, PG; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- HYADES.**—Range, 140; system, Marconi, 480; W. L., 300, 600; service, PG.
- I. D. FLETCHER.**—Range, 200; system, Marconi, 400; W. L., 300, 600; service, PG; hours, N; rate, 4 c. per word, 40 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Coast Transit Co., owner of vessel.
- I. J. MERRITT.**—Range, 100; system, Clapp-Eastham, 500; W. L., 300, 600; service, PG; hours, X; rate, 4 c. per word, 40 c. minimum per radiogram. Note, Radio station operated and controlled by the Merritt & Chapman Derrick & Wrecking Co., owner of vessel.
- IOWAN.**—Hours, X.
- IROQUOIS (WBG).**—Strike out all particulars.
- JAMES DUANE.**—Strike out all particulars.
- JEFFERSON (WAJ).**—Range, 100; system, Kilbourne & Clark, 120; service, PG; hours, N; rate, 4 c. per word, 40 c. minimum per radiogram. Note, Radio station operated and controlled by the Alaska Steamship Co., owner of vessel.
- JIM BUTLER.**—Range, 150; system, Marconi, 480; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Olson & Mahony, owner of vessel.
- J. L. LUCKENBACH.**—Range, 200; system, Marconi, 240; service, PG; hours, N; rate, 4 c. per word, 40 c. minimum per radiogram.
- JOHN D. ROCKEFELLER.**—Range, 300; system, Marconi, 240; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- JOSEPH PULITZER.**—Strike out all particulars.
- KANSAN.**—Range, 200; system, Telefunken, 1000, W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- KENTRA.**—Range, 200; system, Marconi, 400; service, PG; hours, N; rate, 4 c. per word, 40 c. minimum per radiogram.
- KENTUCKIAN.**—Range, 200; system, Telefunken, 1000; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- KROONLAND.**—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG; hours, N; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- KVICHAK.**—Range, 300; system, Kilbourne & Clark, 120; W. L., 300, 600; service, PG; hours, N; rate, 4 c. per word, 40 c. minimum per radiogram. Note, Radio station operated and controlled by the Alaska Packers' Association, owner of vessel.
- LATOUCHE.**—Range, 100; system, Kilbourne & Clark, 120; service, PG; hours, X; rate, 4 c. per word, 40 c. minimum per radiogram. Note, Radio station operated and controlled by the Alaska Steamship Co., owner of vessel.

- IEELANAW.**—System, Marconi, 120; W. L., 300, 600; service, PG; Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Harris, Irby & Vose, owner of vessel.
- LLAMA.**—Range, 200; system, Marconi, 240; service, PG; hours, N.
- MACKINAW.**—Strike out all particulars.
- MARACAS.**—Range, 200; system, Marconi, 400; service, PG; hours, N; rate, 8 c. per word, 80 c. minimum per radiogram.
- MARIPOSA.**—Range, 100; system, Kilbourne & Clark, 120; W. L., 300, 600; service, PG; rate, 4 c. per word, 40 c. minimum per radiogram. Note, Radio station operated and controlled by the Alaska Steamship Co., owner of vessel.
- MAVERICK.**—Strike out system. Note, Standard Oil Co. of California, owner of vessel.
- MILLS.**—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG., hours, N; rate, 4 c. per word, 40 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Ogden Mills, owner of vessel.
- MINNESOTAN.**—Rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- MONTANAN.**—Range, 200; system, Telefunken, 1000; W. L., 300, 600; service PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- NACOOCHEE.**—System, Marconi, 400; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- NIAGARA (KYN).**—Range, 200; system, Marconi, 400; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Howard Gould, owner of vessel (yacht).
- NOKOMIS.**—System, Marconi. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Horace E. Dodge, owner of vessel (yacht).
- NOMA.**—Range, 200; system, Marconi, 480; W. L., 300, 600; service, PG; hours, X; rate, 4 c. per word, 40 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Vincent Astor, owner of vessel (yacht).
- NORTH LAND (KJD).**—Rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- NORTH STAR (KJS).**—System, Marconi, 400; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- NORTH STAR (WHR).**—Strike out all particulars.
- NORTHWESTERN (WAN).**—Range, 100; system, Kilbourne & Clark, 120; service, PG; hours, N. Note, Radio station operated and controlled by the Alaska Steamship Co., owner of vessel.
- NUSHAGAK.**—Range, 300; system, Kilbourne & Clark, 120; rate, 4 c. per word, 40 c. minimum per radiogram. Note, Radio station operated and controlled by the Alaska Packers' Association, owner of vessel.
- OHIOAN.**—Hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- OLD COLONY.**—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG; hours, N; rate, 4 c. per word, 40 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Eastern Steamship Corporation, owner of vessel.
- OLIVER J. OLSON.**—Strike out all particulars.
- ONEONTA.**—Range, 100; system, Marconi, 1000; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- OREGONIAN.**—Range, 200; system, Telefunken, 1000; hours, X; rates North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- OSSABAW.**—Range, 250; system, Marconi, 240; W. L., 300, 600; service, PG; hours, X; rate, 4 c. per word, 40 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Atlantic, Gulf & West Indies Steamship Lines (Mallory Steamship Co.) owner of vessel.

- OWERA.**—Range, 200; system, Marconi, 1000; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- PANAMAN.**—Range, 200; system, Telefunken, 1000; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- PANUCO.**—Range, 200; system, Marconi, 240; service, PG; hours, X; rate, 4 c. per word, 40 c. minimum per radiogram.
- PATHFINDER.**—Range, 150; system, Telefunken; W. L., 300, 600; service, O; hours, N. Notes, Radio station operated and controlled by the United States Department of Commerce, Coast and Geodetic Survey. Surveying ship.
- PATTERSON (NLH).**—Range, 150; system, Telefunken; hours, N. Notes, Radio station operated and controlled by the United States Department of Commerce, Coast and Geodetic Survey. Surveying ship.
- PAVLOF.**—Range, 100; system, Marconi, 480; W. L., 300, 600; service, PG; hours, N; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- PENNSYLVANIAN.**—Range, 200; system, Telefunken, 1000; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- PETROLITE.**—Range, 200; system, Telefunken, 1000; service, PG; hours, 9m-12m, 2s-5s, 8s-10:30s; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Standard Oil Co. of New Jersey, owner of vessel.
- PILOT BOY.**—Strike out system. Note, Texas & Gulf Steamship Co., owner of vessel.
- PIONEER.**—Range, 200; system, Telefunken, 1000; service, PG; hours, 9m-12m, 2s-5s, 8s-10:30s; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Standard Oil Co. of New Jersey, owner of vessel.
- PLATURIA.**—Range, 200; system, Marconi, 240; service, PG; hours, N; rate, 4 c. per word, 40 c. minimum per radiogram.
- POLARINE.**—Range, 200; system, Telefunken, 1000; service, PG; hours, 9m-12m, 2s-5s, 8s-10:30s; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Standard Oil Co. of New Jersey, owner of vessel.
- PRINCETON (KST).**—Range, 200; system, Telefunken, 1000; service, PG; hours, 9m-12m, 2s-5s, 8s-10:30s; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Note, Standard Oil Co. of New Jersey, owner of vessel.
- REDONDO.**—Range, 100; system, Kilbourne & Clark, 120; hours, X. Note, Radio station operated and controlled by the Alaska Steamship Co., owner of vessel.
- RESCUE.**—Range, 100; system, De Forest, 240; W. L., 300, 600; service, PG; hours, X; rate, 8 c. per word, 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Merritt & Chapman Derrick & Wrecking Co., owner of vessel.
- REUCE.**—Range, 100; system, Kilbourne & Clark, 120; W. L., 300, 600; service, PG; hours, X. Note, Radio station operated and controlled by the Columbia River Packers' Association, owner of vessel.
- SAMSON (WOS).**—Strike out all particulars.
- SAN FRANCISCO (KRT).**—Range, 200; system, Marconi, 480; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- SAN JUAN (KGJ).**—System, Marconi, 400.
- SAN MARCOS.**—Rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- SANTA ANA.**—Range, 100; system, Kilbourne & Clark, 120; service, PG; hours, N. Note, Radio station operated and controlled by the Alaska Steamship Co., owner of vessel.
- SANTA CECILIA.**—Range, 100; system, Marconi, 480; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. per radiogram.

- SANTA MARTA.**—Range, 500; system, Composite, 1000; service, PG; hours, N; rate, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated controlled by the Tropical Radio Telegraph Co. Santa Marta Steamship Corporation, owner of vessel.
- SARAMACCA.**—Range, 350; system, Wireless Specialty Apparatus Co., 1000; service, PG; hours, N; rate, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Tropical Radio Telegraph Co. Saramacca Steamship Corporation, owner of vessel.
- SATSUMA.**—Range, 200; system, Marconi, 480; service, PG; hours, N; rate, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co., of America. Barber & Co., owner of vessel.
- SECURITY.**—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG; hours, X.
- SENATOR.**—Range, 100; system, Marconi, 480; W. L., 300, 600; hours, N; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- SENATOR BAILEY.**—W. L., 300, 450, 600; hours, X.
- SHENANGO (KTC).**—System, Marconi, 240; hours, X.
- SHENANGO (WET).**—Strike out all particulars.
- SIBERIA.**—System, Marconi, 300.
- SOMERSET (KSU).**—Range, 200; system, Telefunken, 1000; service, PG; hours, 9m-12m, 2s-5s; 8s-10.30s; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Standard Oil Co. of New Jersey, owner of vessel.
- SPOKANE.**—Range, 100; system, Marconi, 480; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- STARR.**—Range, 100; system, Kilbourne & Clark, 120; W. L., 300, 600; service, PG; hours, X.
- ST. FRANCIS.**—Range, 100; system, Kilbourne & Clark, 120; W. L., 300, 600; service, PG; hours, X; rate, 4 c. per word, 40 c. minimum per radiogram. Note, Alaska Fishermen's Packing Co., owner of vessel.
- ST. NICHOLAS.**—Range, 100; system, Kilbourne & Clark, 120; W. L., 300, 600; service, PG; hours, X. Note, Radio station operated and controlled by the Columbia River Packers' Association, owner of vessel.
- SULTANA.**—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Mrs. Mary W. Harriman, owner of vessel (yacht).
- SURINAME.**—Range, 350; system, Wireless Specialty Apparatus Co., 1000; service, PG; hours, N; rate, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Tropical Radio Telegraph Co. Suriname Steamship Corporation, owner of vessel.
- S. V. LUCKENBACH.**—Range, 200; system, Marconi, 400; service, PG; hours, N; rate, 4 c. per word, 40 c. minimum per radiogram.
- TATOOSH.**—Range, 100; system, Kilbourne & Clark, 120; W. L., 300, 600; service, PG; hours, X.
- TEXAN.**—Range, 250; system, Telefunken, 1000; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- TOPILA.**—System, Marconi, 480; hours, X.
- TYEE JUNIOR.**—Strike out all particulars.
- WAKIVA.**—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG; hours, N; rate, 4 c. per word, 40 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Lamson V. Harkness, owner of vessel (yacht).
- WALLULA.**—Range, 100; system, Marconi, 1000; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- WAPAMA.**—Range, 100; system, Marconi, 240; W. L., 300, 600; service, PG; hours, N; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Chas. R. McCormick & Co., owner of vessel.

- W. B. FLINT.—Range, 100; system, Kilbourne & Clark, 120; W. L., 300, 600; service, PG; hours, X; rate, 4 c. per word, 40 c. minimum per radiogram. Note, Radio station operated and controlled by the Alaska Fishermen's Packing Co., owner of vessel.
- W. B. KEENE.—Range, 200; system, Marconi, 400; service, PG; hours, X.
- WICO.—Range, 200; system, Marconi, 480; service, PG; hours, X.
- WILLIAM P. SNYDER.—Strike out all particulars.
- WILLIAM P. SNYDER, JR.—Strike out all particulars.
- WILPEN.—Strike out all particulars.
- WINDBER.—Range, 100; system, Marconi, 480; W. L., 300, 600; service, PG; hours, N; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- ZAPORA.—Range, 100; system, Kilbourne & Clark, 120; W. L., 300, 600; service, PG; hours, X. Note, Radio station operated and controlled by the International Fisheries Co., owner of vessel.
- ZARA.—Range, 200; strike out system; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Note, F. J. Littlefield, owner of vessel (yacht).

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out particulars after the following call signals: KDV, KDW, KDX, KIJ, KIS, KJA, KMO, KPD, KUP, WAO, WBG, WBH, WBZ, WEQ, WER, WES, WET, WEU, WGD, WHD, WHR, WHW, WNB, WOS, WPB, WPW, WPZ, WWP.

MISCELLANEOUS.

RATES.

The Marconi Wireless Telegraph Co. of America has been authorized by the Department to apply a rate of \$1.25 for 10 words and 12 c. for each additional word, domestic count, for commercial business between its stations at Astoria, Oreg., and Ketchikan, Alaska. These stations will also apply a ship rate of 6 c. per word for North and South American service and 12 c. per word for transoceanic service, the foregoing rates to be effective June 1, 1915.

The Department has approved the reestablishment of the rate of 6 c. per word for limited public service between the Marconi station at Miami, Fla., and the British Government station at Nassau, Bahamas, effective June 1, 1915. The Department authorized an increase in this rate to 12 c. per word, effective March 15, 1915, and the 6 c. rate has been reestablished at the request of the Marconi Co.

COMMERCIAL EXTRA FIRST-GRADE OPERATORS.

The name of Fred Elmer Nickel, of San Francisco, Cal., has been added to the list of those to whom commercial extra first-grade licenses have been issued by the Secretary of Commerce as a reward for long and efficient service.

LIST OF RADIO STATIONS OF THE UNITED STATES.

The owners of all radio stations, other than general and restricted amateur, are requested to forward to the radio inspector of their districts any changes in their stations and information as to the dismantling of stations or the erection of new stations, in order that these changes may be included in the List of Radio Stations of the United States, edition of July 1, 1915, and the bureau's records brought up to date.

NOME, ALASKA, SUMMER SCHEDULE.

The following summer-operating schedule will be maintained by the Signal Corps radio station at Nome, Alaska (Nome time), during the months of July, August, and September:

DAILY.

NULATO.—9 a. m., 11 a. m., 3 p. m., 5 p. m., 7.45 p. m.

St. MICHAEL.—10 a. m., 2 p. m., 6 p. m., 7 p. m.

St. PAUL.—8.30 a. m., 4 p. m.

SUNDAYS AND HOLIDAYS.

NULATO.—9 a. m., 5 p. m.

St. MICHAEL.—10 a. m., 6 p. m.

DAILY.

Schedule after 8 p. m. fixed by Nulato to clear the line east. This sometimes takes to midnight and after.

The time not covered above will be available for ships night and day and for St. Paul, but it should be thoroughly understood that the stations mentioned will clear before surrendering.

AMENDMENTS.

[To be cut out and pasted in your copy.]

The Radio Communication Laws of the United States, edition of July 27, 1914, are hereby amended as follows:

Page 56, paragraph 71, should read:

In order to comply with section 2 of the act of July 24, 1910, every land station open to general public service, and every station on board an American vessel of the first or second class engaged in the foreign trade or transoceanic service, shall have as a part of the station equipment a copy of the official Berne list and supplements thereto as issued. Information concerning the use of this list and method of procuring it is given on page 72, paragraph 196.

Page 72, Paragraph 193, should read:

Supplements to this list are issued monthly under the title "Radio Service Bulletin," and the list is revised annually as of July 1. These monthly supplements contain information concerning Government, commercial, and special stations only, and information regarding amateur stations appears only in the annual edition of the list of Radio Stations of the United States. Amendments to or changes in the Radio Laws and Regulations of the United States are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication. Items of general interest concerning the enforcement of the radio laws are printed in the bulletin from time to time, as occasion warrants.

Page 72, paragraph 195, should read:

A copy of the official Berne list, and supplements as issued, are required as a part of the equipment of every land station open to general public service and every ship station of the first or second class on American vessels engaged in foreign trade or the transoceanic service.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, July, 1915—No. 7

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the list of Radio Stations of the United States, and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the list of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the list of Radio Stations of the United States and the list of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
E. F. SWEET,
Acting Secretary.

ABBREVIATIONS.**INTERNATIONAL ABBREVIATIONS USED IN THIS LIST.****Nature of service:**

PG=General public.

PR=Limited public.

P=Private.

O=Government business exclusively.

Hours of operation:

N=Continuous service.

X=No regular hours.

m=a. m.

s=p. m.

12 m=Midday.

12 s=Midnight.

c.=Cents.

OTHER ABBREVIATIONS.

Name =Name of station.

G. loc. =Geographical location (O=west longitude, N=north latitude).

Call =Radio call letters.

System=Radio system used and sparks per second.

Range =Normal range in nautical miles.

W. L. =Wave lengths.

Service=Nature of service.

Hours =Hours of operation:

Rates =Ship or coast charges in cents. (The rates in the international list are stated in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

Notes =Refers to notes in the Berne list.

Co. =Company.

NEW STATIONS.**LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.**

[Additions to the List of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Longitude and latitude (approximate).	Call signal.	Range.	System.	Wave lengths.
Darien, Panama ^{1,2}	O 79 46 40 N 9 07 20	NBA	1,000	U. S. Navy.....	.....
Iditarod, Alaska ^{3,4}		KIV	200	Telefunken.....	500
Kvichak, Alaska (KMT) ^{5,6}	O 156 37 00 N 59 08 00	KMT	500	Composite, 500..	300, 600, 2,000
Teller, Alaska ⁷		KWT	.....	.....	.....

¹ Radio station operated and controlled by the United States Naval Radio Service, Radio, Va.² Service, O; hours, N.³ Radio station operated and controlled by the Alaska Wireless Telegraph Co.⁴ The station is limited to correspondence with the United States Signal Corps station at Nulato, Alaska; hours, 9m-7s.⁵ Radio station operated and controlled by the North Alaska Salmon Co.⁶ The station is limited to correspondence with ship and shore stations of the North Alaska Salmon Co.; hours, X.⁷ Radio station operated and controlled by Max R. Hirschberg.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name.	Call signal.	Wave lengths.	Owner of vessel.
Communipaw.....	KOE	300, 600	Standard Oil Co. of New Jersey.
Glenpool.....	KOH	300, 600	Do.
Oregon (WOU) ¹	WOU	.....	Crowley Launch & Tugboat Co.
Richard.....	WLG	300, 600	Richard Hulett & Son.
S. M. Fischer ¹	WPH	.....	Reid Wrecking Co.
Wahama.....	KZW	.....	W. W. Campbell (yacht).

¹ System, Marconi.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Station.	Call signal.	Station.
KIV	Iditarod, Alaska.....c	KZW	Wahama.....b
KMT	Kvichak, Alaska.....c	NBA	Darien, Panama.....c
KOE	Communipaw.....b	WLG	Richard.....b
KOH	Glenpool.....b	WOU	Oregon.....b
KWT	Teller, Alaska.....c	WPH	S. M. Fischer.....b

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS

[Additions to the list of Radio Stations of the United States, edition of July 1, 1914, only.]

Name.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Aldene, N. J.....	2XL	300, 600, 1800.....	P	X	Marconi Co.
Chicago, Ill.....	9YH	335, 600.....	P	X	Frank S. Jones.
Denver, Colo. (9ZA).....	9ZA	460, 500, 750.....	P	X	Co. A, Signal Corps, Colorado National Guard.
Lake Geneva, Wis. (9YW)....	9YW	300, 425.....	P	X	Northwestern Military and Naval Academy.
Lake Geneva, Wis. (9YX)....	9YX	300, 425.....	P	X	Do.
Madison, Wis.....	9XM	2000, 2200.....	P	X	University of Wisconsin.
New York, N. Y. (2XG).....	2XG	300, 350, 600, 850, 1800, 2500.	P	X	Radio Telephone & Telegraph Co.
New York, N. Y. (2YS).....	2YS	250, 300, 600.....	P	X	William S. Wilson.
Port Chester, N. Y.....	2ZP	200, 425, 600.....	P	X	John W. Hubbard.
San Francisco, Cal. (6XD)....	6XD	300, 600, 2500, 3000....	P	X	Dwyer Wireless Telephone & Telegraph Co.
Trinidad, Colo.....	9ZB	450, 500, 750.....	P	X	Co. A, Signal Corps, Colorado National Guard.

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
2XG	Second district:	9XM	Ninth district:
2XL	New York, N. Y.	9YH	Madison, Wis.
2YS	Aldene, N. J.	9YW	Chicago, Ill.
2ZP	New York, N. Y.	9YX	Lake Geneva, Wis.
6XD	Port Chester, N. Y.	9ZA	Do.
	Sixth district:	9ZB	Denver, Colo.
	San Francisco, Cal.		Trinidad, Colo.

ALTERATIONS AND CORRECTIONS.**LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.**

[Alterations and corrections to be made to the list of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

ASTORIA, OREG.—Range, 250–1500; system, Marconi, 480; W. L., 300, 600, 1800, 3100. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. The long wave lengths are used for limited public service with Ketchikan, Alaska; rates, for commercial business, \$1.25 for 10 words (10 word minimum) and 12 c. for each additional word, domestic count. For press dispatches, 3 c. per word.

HEEIA POINT, HAWAII.—Notes, Radio station operated and controlled by the Federal Telegraph Co. The station is reserved for correspondence with a land station at South San Francisco, Cal.; rates, regular messages, 25 c. per word, cable count, no minimum. Night lettergrams, plain English, cable count, code address allowed, 13 words minimum including prefix, \$1. Each additional word, 8 c. Week-end letters, plain English, cable count, code address allowed, 25 word minimum including prefix, \$1.50. Each additional word, 6 c.

JUNEAU, ALASKA.—Range, 250–1500; system, Marconi, 480; W. L., 300, 600, 1800, 3100; service, PG; hours, N; rates, North and South American service, 6 c. per word, 60 c. minimum per radiogram, transoceanic service, 12 c. per word, \$1.20 minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. The long wave lengths are used for limited public service with Ketchikan, Alaska; rates, 50 c. for 10 words (10 word minimum) and 5 c. for each additional word, domestic count.

JUPITER, FLA.—Strike out W. L., service, O.

KETCHIKAN, ALASKA.—Range, 250–1500; system, Marconi, 480; W. L., 300, 600, 1800, 3100; service, PG; hours, N; rates, North and South American service, 6 c. per word, 60 c. minimum per radiogram, transoceanic service, 12 c. per word, \$1.20 minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. The long wave lengths are used for limited public service with Astoria, Oreg.; rates, for commercial business, \$1.25 for 10 words (10 word minimum) and 12 c. for each additional word, domestic count. For press dispatches, 3 c. per word. The station also communicates with Juneau, Alaska, rates, 50 c. for 10 words (10 word minimum) and 5 c. for each additional word, domestic count.

MIAMI, FLA.—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. The station also exchanges correspondence with Nassau (Bahamas); rate, 6 c. per word, no minimum.

SOUTH SAN FRANCISCO, CAL.—Notes, Radio station operated and controlled by the Federal Telegraph Co. The station is reserved for correspondence with a land station at Heeia Point (near Honolulu), Hawaii; rates, regular messages, 25 c. per word, cable count, no minimum. Night lettergrams, plain English, cable count, code address allowed, 13 words minimum including prefix, \$1. Each additional word 8 c. Week-end letters, plain English, cable count, code address allowed, 25 word minimum including prefix, \$1.50. Each additional word 6 c.

TAMPA, FLA.—Hours, 7m–10s.

UNALGA, ALASKA.—Strike out all particulars.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the list of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

BUNKER HILL.—Range, 200; system, Marconi, 400; W. L., 300, 600; service, PG; hours, N; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Eastern Steamship Corporation, owner of vessel.

CADDO.—Range, 200; system, Telefunken, 1000; service, PG; hours, 9m–4s, 8s–12s; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Standard Oil Co. of New Jersey, owner of vessel.

- CITY OF ATLANTA.**—System, Marconi, 400; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- CITY OF CHICAGO.**—Name, City of St. Joseph.
- COALINGA.**—Range, 400; system, Poulsen arc; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Federal Telegraph Co. Union Steamship Co. (Union Oil Co.), owner of vessel.
- DAKOTAN.**—Hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- DAMARA.**—Name, Florence Luckenbach.
- DOROTHY BRADFORD.**—Strike out range; strike out system. Note, Cape Cod Steamship Co., Trustees, owner of vessel.
- GRACE DOLLAR.**—System, Marconi. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Grace Dollar Steamship Co., owner of vessel.
- GREENWOOD.**—Strike out all particulars.
- INDEPENDENT.**—Strike out all particulars.
- KANSAS CITY.**—Strike out all particulars.
- LUCY NEFF.**—Strike out all particulars.
- LUNDIN POWER LIFEBOAT.**—Name, Lundin; system, Marconi, 240; W. L., 300, 600; service, PG; hours, X; rates, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Welin Marine Equipment Co., owner of vessel.
- LYMAN STEWART.**—Range, 400; system, Poulsen arc; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Federal Telegraph Co. Union Oil Co. of California, owner of vessel.
- MISSOURIAN.**—Rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- MORENI.**—Range, 200; system, Telefunken, 1000; service, PG; hours, 9m—12m, 2s—5s, 8s—10:30s; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Standard Oil Co. of New Jersey, owner of vessel.
- NOKOMIS.**—Range, 100; system, Marconi, 240; W. L., 300, 600; service, PG; hours, X; rates, 2 c. per word, 20 c. minimum per radiogram.
- NORTH STAR (KYZ).**—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Cornelius Vanderbilt, owner of vessel (yacht).
- PRISCILLA.**—System, Fessenden, 260; W. L., 300, 550, 600.
- RESTORER.**—System, Composite, 480; W. L., 250, 300, 600.
- ROCHELLE.**—Strike out all particulars.
- SANTA CLARA (KIR).**—Strike out all particulars.
- SANTA RITA (WTG).**—System, Marconi; W. L., 300, 600. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Sun Co., owner of vessel.
- SAVAGE (KRS).**—Strike out all particulars.
- SEA OTTER.**—Strike out all particulars.
- SEMINOLE (KVJ).**—Strike out all particulars.
- SEWARD.**—Rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- SIBILA.**—Range, 150; system, Marconi, 250; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Sibiria Steamship Corporation (Atlantic Fruit Co.) owner of vessel.
- SIXAOLA.**—Range, 500; system, Wireless Specialty Apparatus Co., 1000; service, PG; hours, N; rates, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Tropical Radio Telegraph Co. Sixaola Steamship Corporation, owner of vessel.

SULTANA.—Range, 200; system, Marconi, 240; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram.

WINONA.—Strike out all particulars.

WOODBURY.—Strike out all particulars.

ZEALANDIA (KNR).—Range, 200; system, Fessenden, 1000; W. L., 300, 600; service, PG; hours, X; rates, 4 c. per word, 40 c. minimum per radiogram. Notes, Radio station operated and controlled by the National Electric Signaling Co. Fiske Trading Co., owner of vessel.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

WDT, read: City of St. Joseph (b); WNM, read: Florence Luckenbach (b). Strike out particulars following the call signals KIR, KNQ, KRS, KVJ, KYS, NPV, NRJ, NRV, WNR, WPI, WQG, WWS.

MISCELLANEOUS.

PANAMA-PACIFIC INTERNATIONAL EXPOSITION.

The Bureau's radio exhibit at the Panama-Pacific International Exposition has been awarded a silver medal for the educational demonstration of methods and apparatus for the enforcement of the Federal radio laws. This exhibit consists of all the necessary instruments used by radio inspectors in the inspection of radio equipment—a model ship set and a model amateur set.

It has been reported to the Bureau that signals from the Eilvese station in Germany have been received at the Bureau's station, and time signals are received daily from the Mare Island Navy Yard station sufficiently audible to allow visitors to set their watches at a distance of 30 feet from the radio receiver, and considerable interest has been manifested in these two features of the exhibit.

A radio inspector is in charge of the exhibit at all times to demonstrate the method of inspection, to give information concerning the radio laws and regulations to owners and masters of vessels, operators and amateurs, and to distribute the Department's publications concerning the radio laws and regulations. The inspector in charge is prepared to conduct examinations of applicants for radio operator licenses.

COMMERCIAL OPERATOR FINED.

A commercial radio operator of New York City was reported by the radio inspector of that district for changing his second-grade commercial operator's license to resemble a first-grade license and obtaining employment as a first-grade operator. The case was reported to the United States district attorney for prosecution, and upon pleading guilty to a charge of forgery the operator was fined \$25 by Judge Grubb, of the United States district court.

GENERAL STATISTICS OF THE INTERNATIONAL BUREAU FOR 1913.

Copies of the General Statistics of Radiotelegraphy for the year 1913 may be procured from the International Bureau of the Telegraph Union, Radiotelegraphic Service, Berne, Switzerland, at 30 centimes (6 cents) per copy, postage extra.

RADIO SERVICE PERSONNEL.

Benjamin E. Wolf, radio inspector in charge of the Bureau's exhibit at the Panama-Pacific International Exposition, has been placed in charge of the Seattle office and Ellery W. Stone, assistant radio inspector at San Francisco, has been detailed to the exposition as the Bureau's representative. William F. Macomber has been appointed as an assistant radio inspector at San Francisco.

R. D. Duncan, jr., assistant radio inspector at New York, has been transferred to the Bureau of Standards.

UNITED STATES NAVAL RADIO SERVICE CHANGES.

The Jupiter (Fla.) station of the United States Naval Radio Service has been closed to commercial traffic. Government messages and position reports will be accepted through that station.

The Unalga (Alaska) station of the United States Naval Radio Service has been discontinued and service may be obtained through the Dutch Harbor station instead.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, August, 1915—No. 8

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E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
E. F. SWEET,
Acting Secretary.

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Hours =Hours of operation.

Rates =Ship or coast charges in cents. (The rates in the international list are stated in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

Notes =Refers to notes in the Berne list.

Co. =Company.

NOTICE.

It will be noted that the additions, alterations, and corrections contained in this bulletin apply to the List of Radio Stations of the United States, edition of July 1, 1914.

The additions, alterations, and corrections which will appear in the October issue of this bulletin will be supplementary to the List of Radio Stations of the United States, edition of July 1, 1915, which is now in the hands of the printer, although it is not possible at this time to anticipate its delivery. All additions, alterations, and corrections appearing in the October and later editions of this bulletin should be saved and inserted in the new annual list as soon as it is received.

A sufficient number of blank pages will be inserted in the back of the new list in order that the additions appearing in the bulletins may be clipped and pasted therein, enabling operators and others concerned to keep their annual list up to date with very little trouble.

NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Longitude and latitude (approximate).	Call signal.	Range.	System.	Wave lengths.
Fort Adams, R. I. ^{1,2}		WUU	125	U. S. Army, 500.	1200
Jualin, Alaska ³		KJA		Marconi.	
Portland, Oreg. (KDP) ^{4,5}	O 122 42 30	KDP	150	Composite, 450..	300, 550, 600
	N 45 30 45				
Portland, Oreg. (KGN) ^{6,6}	O 122 41 00	KGN	150	Composite, 400..	300, 800, 1700
	N 45 32 00				
Rialto, Cal. ⁷	O 117 26 53	KJR	250	Massie, 200.....	300, 800, 1610
	N 34 12 08				
Tolovana, Alaska ⁸	O 149 30 00	KIZ	300	Telefunken, 1000	300, 600
	N 65 00 00				

¹ Radio station operated and controlled by the United States Signal Corps, War Department, Washington, D. C.

² Service, O; hours, 6m. 10s.

³ Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.

⁴ Radio station operated and controlled by Charles L. Austin. The station is limited to correspondence on ships' business with vessels entering and leaving the port of Portland.

⁵ Hours, X.

⁶ Radio station operated and controlled by the Northwestern Electric Co.

⁷ Radio station operated and controlled by the Southern California Edison Co. The station is limited to correspondence with stations of the Southern California Edison Co.

⁸ Radio station operated and controlled by the Alaska Wireless Telegraph Co.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Vessel.	Call signal.	System.	Wave lengths.	Service.	Hours.
Atlanta ¹	KGR	Marconi.	300, 600		
Cacicque ²	WBE		300, 600		
Captain T. M. Morrison ³	WYZ	U. S. Army, 500.		O	X
General Geo. H. Weeks ⁴	WZT	do.	1200	O	X
General G. W. Getty ⁵	WYS	do.	1200	O	X
General J. M. Brannan ⁶	WZV	do.	1200	O	X
General Nathaniel Greene ⁷	WZR	do.	1200	O	X
General Richard Arnold ⁸	WYV	do.	1200	O	X
General R. N. Batchelder ⁹	WZW	do.	1200	O	X
General Timothy Pickering ¹⁰	WZQ	do.	1200	O	X
Henry Wilson ¹¹	WZS	do.	1200	O	X
Major Albert G. Forse ¹²	WYQ	do.	1200	O	X
Ossipee ¹³	NRJ	U. S. C. G., 1000.	{ 300, 600, 750, 1000 }	PG	N
Roosevelt ¹⁴	NLR	Composite, 400..	300, 600	O	X
Sprigg Carroll ¹⁵	WZU	U. S. Army, 500.	1200	O	X
Tallapoosa ¹⁶	NRV	U. S. C. G., 1000.	{ 300, 600, 750, 1000 }	PG	N

¹ Radio station operated and controlled by the United States Signal Corps, War Department, Washington, D. C. Army tug.

² Radio station operated and controlled by the Cuba Improvement & Steamship Co., owner of vessel.

³ W. R. Grace & Co., owner of vessel.

⁴ Range, 30.

⁵ Radio station operated and controlled by the United States Coast Guard, Treasury Department, Washington, D. C.

⁶ Range, 300; rates, 4 cents per word, 40 cents minimum per radiogram.

⁷ Radio station operated and controlled by the United States Department of Commerce, Bureau of Fisheries, Washington, D. C.

⁸ Range, 300.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b = ship station; c = land station.]

Call signal.	Station.	Call signal.	Station.
KDP	Portland, Oreg.....c	WYQ	Major Albert G. Forse.....b
KGN	Portland, Oreg.....c	WYS	General G. W. Getty.....b
KGR	Atlanta.....b	WYY	General Richard Arnold.....b
KJZ	Tolovana, Alaska.....c	WYZ	Captain T. M. Morrison.....b
KJA	Jualin, Alaska.....c	WZQ	General Timothy Pickering.....b
KJR	Rialto, Cal.....c	WZR	General Nathanael Greene.....b
NLR	Roosevelt.....b	WZS	Henry Wilson.....b
NRJ	Ossipee.....b	WZT	General Geo. H. Weeks.....b
NRV	Tallapoosa.....b	WZU	Sprigg Carroll.....b
WBE	Cacique.....b	WZW	General J. M. Brannan.....b
WUU	Fort Adams, R. I.....c	WZW	General R. N. Batchelder.....b

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1914, only.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Athens, Ohio.....	8YP	300, 425.....	P	X	Ohio University.
Bremerton, Wash.....	7XL	300, 600, variable.....	P	X	T. M. Libby.
Rapid City, S. Dak.....	9XA	Variable.....	P	X	Claude C. Van Nuys (South Dakota School of Mines).

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
7XL	Seventh district: Bremerton, Wash.	9XA	Ninth district: Rapid City, S. Dak.
8YP	Eighth district: Athens, Ohio.		

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

DENVER, COLO.—Hours, 9m–11.30m, 7.30s–11s.

GALVESTON, TEX.—W. L., 300, 500, 600; hours, 7m–12m, 1s–2m.

IDITAROD, ALASKA.—G. loc., (approximate) 0 158° 00' 00", N 62° 40' 00"; hours, 9m–7s.

NEWTON, MASS.—System, Clapp-Eastham, 2500. Notes, Radio station operated and controlled by Ralph C. Emery. The station is limited to private correspondence with vessels for which John S. Emery & Co. (Inc.), are agents.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

ALABAMA (WFB).—Hours, X.

ALBERTA.—Range, 200; system, Marconi, 1000; W. L., 300, 600; 1800; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Fred Gilbert Bourne, owner of vessel (yacht).

- ATLANTIC.**—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. New York Intercean & Coastwise Steamship Co., owner of vessel.
- ATLANTIC CITY.**—Strike out all particulars.
- CAROLINA (WFE).**—Hours, X.
- CITY OF ALPENA II.**—Strike out system. Note, Detroit & Cleveland Navigation Co., owner of vessel.
- CITY OF BENTON HARBOR.**—Hours, X.
- CITY OF DETROIT II.**—Strike out system. Note, Detroit & Cleveland Navigation Co., owner of vessel.
- CITY OF MACKINAC II.**—Strike out system. Note, Detroit & Cleveland Navigation Co., owner of vessel.
- CITY OF ST. IGNACE.**—Strike out system. Note, Detroit & Cleveland Navigation Co., owner of vessel.
- CITY OF ST. JOSEPH.**—System, Marconi, 240; hours, X.
- CITY OF SYDNEY.**—Strike out system. Note, Pacific Mail Steamship Co., owner of vessel.
- COMMONWEALTH (KXC).**—System, Fessenden, 260; W. L., 300, 550, 600.
- EDGAR H. VANCE.**—Strike out system. Note, Hammond Lumber Co., owner of vessel.
- EVANGELINE.**—System, Marconi, 1000. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Evangeline Co. (Plant Line Steamship Co.), owner of vessel.
- FINLAND.**—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. International Mercantile Marine Co. (Panama Pacific Line), owner of vessel.
- FORWARD (KPF).**—Rates, 4c. per word, 40c. minimum per radiogram.
- GULF COAST.**—Range 200; system, Marconi, 240; service, PG; hours, X; rate, 4c. per word, 40c. minimum per radiogram.
- HOWARD.**—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4c. per word, 40c. minimum per radiogram; transoceanic service, 8c. per word, 80c. minimum per radiogram.
- HOWICK HALL.**—Hours, X.
- IAQUA.**—Strike out system. Note, John A. McGregor, owner of vessel.
- INDIANA (WFC).**—Hours, X.
- J. B. STETSON.**—Strike out system. Note, Hicks-Hauptman Navigation Co., owner of vessel.
- KROONLAND.**—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. International Mercantile Marine Co. (Panama-Pacific Line), owner of vessel.
- LEELANAW.**—Strike out all particulars.
- LUNDIN.**—Strike out all particulars.
- LYSISTRATA.**—System, Marconi; W. L., 300, 600; service, PG. Note, Radio station operated and controlled by James Gordon Bennett, owner of vessel (yacht).
- OCEANA.**—Strike out system. Note, Bermuda-American Steamship Corporation, owner of vessel.
- OREGON (WOU).**—Rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Crowley Launch & Tugboat Co., owner of vessel.
- PACIFIC.**—Range, 250; system, Wireless Specialty Apparatus Co., 1000; service, PG; hours, X; rate, 8 c. per word, 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Emery Steamship Co., owner of vessel.
- PILGRIM.**—Strike out all particulars.
- P. R. R. BARGE 707.**—Strike out all particulars.
- PURITAN (KXX).**—Strike out all particulars.
- PURITAN (WDU).**—Hours, X.
- RAMOS.**—Rates, 4 c. per word, 40 c. minimum per radiogram. Note, Sloan, Danenhower & Co., owner of vessel.
- RIVERSIDE.**—Strike out all particulars.
- SAN MARCOS.**—System, Marconi, 400; hours, X.
- SANTA RITA (WTG).**—Rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram.
- SANTA ROSA.**—Strike out all particulars.
- S. M. FISCHER.**—Range, 200; system, Marconi, 450; W. L., 300, 600; service, PG; hours, X; rate, 2 c. per word, 20 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Reid Wrecking Co., owner of vessel.

SONOMA (WHM).—System, Poulsen arc. Note, Oceanic Steamship Co., owner of vessel.

WESTERN STATES.—Strike out system. Note, Detroit & Cleveland Navigation Co., owner of vessel.

WINCHESTER.—Strike out all particulars.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out all particulars following the call signals KMN, KPR, KVX, KXG, KXX, KZK, WGN, WNI, and WRM.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1914, only.]

AMESBURY, MASS.—Strike out all particulars.

ANN ARBOR, MICH.—W. L., 450, 600, 1800.

DETROIT, MICH.—Strike out all particulars.

GLOUCESTER, MASS.—W. L., 300, 600, variable; service, P; hours, X.

NEW YORK, N. Y. (2XH).—W. L., 300, 540, 600, 800.

MISCELLANEOUS.

COMMERCIAL TRAFFIC REGULATIONS OF NAVAL RADIO SERVICE.

The superintendent of the United States Naval Radio Service, Radio, Va., announces the completion of the Commercial Traffic Regulations of that service. These books may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 25 cents per copy.

LONDON RADIOTELEGRAPH CONVENTION.

The Department has been advised by the State Department that since January 1, 1915, New Caledonia and Tonga have acceded to the International Radiotelegraph Convention, signed at London on July 5, 1912.

RADIO SERVICE PERSONNEL.

Charles Blankenship, of Everett, Mass., formerly radio electrician on the coast-guard cutter *Gresham*, has been appointed as an assistant radio inspector in the service of the Bureau of Navigation at Chicago, Ill.

AWARD OF MEDALS TO BUREAU OF NAVIGATION AND PERSONNEL.

The superior jury of the Panama-Pacific International Exposition has awarded the following medals to the Bureau of Navigation: Radio apparatus, medal of honor; educational demonstration of methods and apparatus for enforcement of the Federal radio law, silver medal.

Silver medals for collaboration with the Department of Commerce in its exhibit at the exposition have been awarded by the superior jury to V. Ford Greaves, radio engineer, and Benjamin E. Wolf, radio inspector.

COMMERCIAL OPERATOR REPRIMANDED.

The attention of all operators is again invited to the Laws and Regulations of the Department, page 74, paragraph 210, regarding the use of profane or obscene language in radio communication.

The superintendent of the Naval Radio Service recently reported a commercial operator in the sixth district for a violation of this regulation, and the radio inspector at San Francisco recommended that his license privilege be suspended. The operator has been severely reprimanded by the Secretary of Commerce for his misconduct, no further action being taken on account of the recommendation of the operator's employer, attesting to his previous good record.

Any future violations of this regulation may be subject to more drastic action on the part of the Department.

ADDITIONAL COPIES
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UNIVERSITY OF CHICAGO

RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, September, 1915—No. 9

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the list of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the list of Radio Stations of the United States.

The Bulletin contains tables of new stations, alterations, and corrections under headings, so that the list of Radio Stations of the United States and the list of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of The Bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in The Bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
E. F. SWEET,
Acting Secretary.

ABBREVIATIONS.**INTERNATIONAL ABBREVIATIONS USED IN THIS LIST.****Nature of service:**

PG=General public.

PR=Limited public.

P=Private.

O=Government business exclusively.

Hours of operation:

N=Continuous service.

X=No regular hours.

m=a. m.

s=p. m.

12 m=Midday.

12 s=Midnight.

c.=Cents.

OTHER ABBREVIATIONS.

Name =Name of station.

G. loc. =Geographical location (O=west longitude, N=north latitude).

Call =Radio call letters.

System=Radio system used and sparks per second.

Range =Normal range in nautical miles.

W. L. =Wave lengths.

Service=Nature of service.

Hours =Hours of operation.

Rates =Ship or coast charges in cents. (The rates in the international list are stated in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

Notes =Refers to notes in the Berne list.

Co. =Company.

NOTICE.

It will be noted that the additions, alterations, and corrections contained in this Bulletin apply to the List of Radio Stations of the United States, edition of July 1, 1914.

The additions, alterations, and corrections which will appear in the October issue of this bulletin will be supplementary to the List of Radio Stations of the United States, edition of July 1, 1915, which is now in the hands of the printer, although it is not possible at this time to anticipate its delivery. All editions, alterations, and corrections appearing in the October and later editions of this Bulletin should be saved and inserted in the new annual list as soon as it is received.

A sufficient number of blank pages will be inserted in the back of the new list in order that the additions appearing in the Bulletins may be clipped and pasted therein, enabling operators and others concerned to keep their annual list up to date with very little trouble.

NEW STATIONS.**SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.**

[Additions to the List of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name.	Call signal.	Wave lengths.	Owner of vessel.
Chalmette.....	KKC	300, 600...	Southern Pacific Co.
Mukilteo.....	WRL	300, 600...	Charles Nelson Co.
Remlik ¹	KZR	300, 600...	Willis S. Kilmer.
Roamer.....	KZN	.....	State of Florida.

¹ Range, 200; system, Marconi, 240; service, PG; hours, X; rates, North and South American service, 4c. per word, 40c. minimum per radiogram; transoceanic service, 8c. per word, 80c. minimum per radiogram. Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.

SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Call signal.	Station.	Call signal.	Station.
KKK KZN	Chalmette. Roamer.	KZR WRL	Remlik. Mukilteo.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1914, only.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Cincinnati, Ohio.....	8ZH	200, 300.....	P	X	Clayton M. Howes (Hughes High School).
Lima, Ohio.....	8YL	200, 425.....	P	X	J. E. Collins (Board of Education).
Mobile, Ala.....	5ZM	200, 300, 450.	P	X	Ben W. Martin.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

CHICAGO, ILL.—W. L., 300, 500, 600; service, PG and PR. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. The station is open only during the season of navigation.
DETROIT, MICH. (WDR).—Name, River Rouge, Mich.; system, Marconi, 480; W. L., 300, 500, 600; service, PG and PR.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1914, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

ADDISON E. BULLARD.—Strike out all particulars.
ADMIRAL SCHLEY.—Rates, 4c. per word; 40c. minimum per radiogram.
ADMIRAL WATSON.—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Pacific-Alaska Navigation Co., owner of vessel.
ALLIANCE.—Range, 100; system, Marconi, 120; W. L., 300, 600; service, PG; hours, N. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. North Pacific S. S. Co., owner of vessel.
AMERICA.—Strike out all particulars.
ANTILLA.—Hours, N.
ASTRAL.—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Transportation Co., owner of vessel.
BRILLIANT.—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Transportation Co., owner of vessel.
CALIFORNIA (KYQ).—Strike out system. Note, Mrs. Clara B. Stocker, owner of vessel (yacht).
CARLOS.—Strike out system. Note, Olson & Mahony Steamship Co., owner of vessel.
CAROLYN.—Strike out all particulars.
COMET (KTJ).—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Transportation Co., owner of vessel.
DOROTHY BRADFORD.—Range, 100; system, Wireless Specialty Apparatus Co., 1,000; strike out rates. Notes, Radio station operated and controlled by the Cape Cod Steamship Co., trustees, owner of vessel. Apparatus for emergency use only; not open to public service.

- EDGAR H. VANCE.—Strike out all particulars.
 FORWARD (KPF).—Strike out all particulars.
 GLENPOOL.—Range, 200; system, Telefunken, 1,000; service, PG; hours, 9m–12m, 2s–5s, 8s–10.30s; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Standard Oil Co. of New Jersey, owner of vessel.
 I. J. MERRITT.—Strike out all particulars.
 KINGFISHER.—Strike out all particulars.
 LAKEPORT.—Strike out all particulars.
 LAKEWOOD.—Strike out all particulars.
 MINNESOTA (WMI).—System, Marconi, 480; W. L., 300, 600; service, PG; rates, 8 c. per word, 80 c. minimum per radiogram.
 MONTAUK.—Strike out all particulars.
 MOTANO.—Range, 200; system, Telefunken, 1,000; service, PG; hours, 9m–12m, 2s–5s, 8s–10.30s; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Standard Oil Co. of New Jersey, owner of vessel.
 OSSABAW.—Strike out all particulars.
 PERFECTION.—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Transportation Co., owner of vessel.
 RADIANT.—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Transportation Co., owner of vessel.
 RAYO.—Notes, Radio station operated and controlled by the Atlantic Communication Co. Standard Transportation Co., owner of vessel.
 SATILLA.—Strike out all particulars.
 SECURITY.—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Transportation Co., owner of vessel.
 SHINNECOCK.—Strike out all particulars.
 S. O. Co. No. 92.—Name, S. T. Co. No. 92. Note, Standard Transportation Co., owner of vessel.
 S. O. Co. No. 94.—Name, S. T. Co. No. 94. Note, Standard Transportation Co., owner of vessel.
 STANDARD.—Note, Standard Transportation Co., owner of vessel.
 THEODORE ROOSEVELT.—Strike out all particulars.
 ULYSSES.—System, Marconi; W. L., 300, 600. Note, Panama Canal, owner of vessel.
 VESTA (KTS).—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Standard Transportation Co., owner of vessel.
 WAHAMA.—Strike out all particulars.
 WM. E. CHAPMAN.—Strike out all particulars.
 WYANDOTTE.—Strike out all particulars.

SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KTP, read: S. T. Co. No. 94. KTY, read: S. T. Co. No. 92. Strike out particulars after the following call signals: KEN, KEO, KNF, KNS, KNT, KNW, KNZ, KPF, KRM, KRQ, KWL, KZW, WCT, WDJ, WDK, WPK, WQE.

ADDITIONAL COPIES

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UNIVERSITY OF CALIFORNIA

RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, October, 1915—No. 10

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

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Items of general interest concerning the enforcement of the radio laws are printed in The Bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
E. F. SWEET,
Acting Secretary.

NEW STATIONS.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name.	Call signal.	System.	Wave lengths.	Service.	Hours.
Alicia ¹	KZB	De Forest, 800.....	300, 600	PG	X
Azaiea ²	NLO				
Ellington ³	NLN				
Fort Bragg ⁴	WLH		300, 600		
Mount Hope ⁴	KOL	Composite, 200.....	300, 600	P	X
Silver Shell ⁵	WIA	Marconi.....	300, 600		

¹ Range, 45; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by Alfred I. du Pont, owner of vessel (yacht).

² U. S. Department of Labor (Immigration Service), owner of vessel.

³ Higgins Lum' er Co., owner of vessel.

⁴ Radio station operated and controlled by the Providence, Fall River & Newport Steamboat Co., owner of vessel.

⁵ Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Silver Shell Steamship Co., owner of vessel.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[ADDITIONS TO THE LIST OF RADIO STATIONS OF THE UNITED STATES, EDITION OF JULY 1, 1915, ONLY.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Auburn, Ala.....	5YA	1625, 1800	P	X	Alabama Polytechnic Institute.
Davenport, Iowa.....	9XE	300	P	X	William H. Kirwan.
Denver, Colo.....	8ZD	200, 425	P	X	Edward C. Stockman.
Louisville, Ill.....	9ZL	200, 425	P	(G)	Cecil Bridges.
New Orleans, La.....	5XM	300, 600	P	X	Marconi Co.
New York, N. Y.....	2YM	233, 300, 600	P	X	Y. M. C. A. Telegraph School.
Ridgway, Pa.....	8XO	300, 425	P	X	P. Osterhout (Pittsburgh Wireless Equipment Co.).
Rockford, Ill.....	9YB	200	P	X	Rockford School of Engineering.
Tiffin, Ohio.....	8ZT	200, 425	P	(G)	John J. Grossman.
Washington, D. C.....	3YM	200, 300, 500	P	X	McKinley Manual Training School.
Do.....	3YN	200, 400, 1800	P	X	James E. Smith (National Radio School).

11.55 a. m. to 1 p. m.; 6.30 p. m. to 11 p. m.

17 p. m. to 10.30 p. m.

SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Call signal.	Station.	Call signal.	Station.
KOL	Mount Hope.	NLO	Azaiea.
KZB	Alicia.	WIA	Silver Shell.
NLN	Ellington.	WLH	Fort Bragg.

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
2YM	Second district: New York, N. Y.	8XO	Eighth district: Ridgway, Pa.
3YM	Third district: Washington, D. C.	8ZT	Tiffin, Ohio.
3YN	Do.	9XE	Ninth district: Davenport, Iowa.
5XM	Fifth district: New Orleans, La.	9YB	Rockford, Ill.
5YA	Auburn, Ala.	9ZD	Denver, Colo.
		9ZL	Louisville, Ill.

ABBREVIATIONS.**INTERNATIONAL ABBREVIATIONS USED IN THIS LIST.****Nature of service:**

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O=Government business exclusively.

Hours of operation:

N=Continuous service.

X=No regular hours.

m=a. m.

s=p. m.

12 m=Midday.

12 s=Midnight.

c.=Cents.

OTHER ABBREVIATIONS.

Name =Name of station.

G. loc. =Geographical location (O=west longitude, N=north latitude).

Call =Radio call letters.

System =Radio system used and sparks per second.

Range =Normal range in nautical miles.

W. L. =Wave lengths.

Service =Nature of service.

Hours =Hours of operation.

Rates =Ship or coast charges in cents. (The rates in the international list are stated in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

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ASHTABULA, OHIO.—System, Marconi, 480; W. L., 300, 500, 600; hours, 7.30m–11.30m, 12.30s–5s.

BALTIMORE, MD.—System, Marconi-United, 400.

BUFFALO, N. Y.—System, Marconi, 480; W. L., 300, 500, 600; hours, Sept. 16 to Dec. 15 and Apr. 15 to June 2, 7s–12s, 1m–7m; June 3 to Sept. 15, 7m–12m, 1s–6s, 7s–12s, 1m–6m.

- CALUMET, MICH.—System, Marconi, 480; W. L., 300, 500, 600. Note. Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.
- CLEVELAND, OHIO.—System, Marconi, 480; W. L., 300, 500, 600.
- DULUTH, MINN.—System, Marconi, 480; W. L., 300, 500, 600. Note. Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.
- FORT WORDEN, WASH.—Service, PG.
- FRANKFORT, MICH.—System, Marconi, 480; W. L., 300, 500, 600.
- GRAND HAVEN, MICH.—System, Marconi, 480; W. L., 300, 500, 600.
- LUDINGTON, MICH.—System, Marconi, 480; W. L., 300, 500, 600.
- MACKINAC ISLAND, MICH.—G. loc., O 84° 37' 00'', N 45° 50' 00''; system, Marconi, 480; W. L., 300, 500, 600; hours, Sept. 16 to Oct. 1 and June 7 to June 30, sunset to sunrise; July 1 to Sept. 15, 1m-6m, 7m-12m, 1s-6s, 7s-12s.
- MANISTIQUE, MICH.—System, Marconi, 480; W. L., 300, 500, 600.
- MANITOWOC, WIS.—System, Marconi, 480; W. L., 300, 500, 600. Note. Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America.
- MARSHFIELD, OREG.—System, Marconi, 300; hours, first 15 minutes of each hour from 8m-6s.
- MILWAUKEE, WIS.—G. loc., O 87° 55' 25''-N 43° 02' 50''; system, Marconi, 480; W. L., 300, 500, 600.
- NEW ORLEANS, LA. (WHK).—Hours, 7.05m-8m, 10m-10.25m, 10.45m-10.55m, 1s-1.20s, 3s-4s, 5s-5.30s, 6s-6.30s, 8s-8.55s, 10s-11s.
- NOME, ALASKA.—Hours, N.
- SAGAPONACK, N. Y.—Hours, X.
- SEATTLE, WASH.—Service, PG and PR; hours, 8m-12m, 1s-5s, except Sundays and holidays; rates, PG service, 3 c. per word 30 c. minimum per radiogram. Notes, Radio station operated and controlled by the city of Seattle (harbor department). The station corresponds with the harbor patrol boat and all vessels entering Puget Sound. No charge for messages relating to shipping.
- TOLOVANA, ALASKA.—Name, Brooks, Alaska.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

- ADMIRAL DEWEY.—Rates, 4 c. per word 40 c. minimum per radiogram.
- ADMIRAL FARRAGUT.—Rate, 4 c. per word 40 c. minimum per radiogram.
- ARIZONA.—System, Marconi, 240.
- BERKSHIRE.—Strike out all particulars.
- BRUNSWICK.—Range, 150.
- CAROLINA.—Range, 100; system, Marconi, 240.
- CASSANDRA.—Name, Casiana. Note, Edward L. Doheny, owner of vessel (yacht).
- CELILO.—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Celilo Steamship Co., owner of vessel.
- CHALMETTE.—Range, 300; system, Marconi, 1000; W. L., 300, 450, 600; service, PG; hours, N; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Southern Pacific Co., owner of vessel.
- CITY OF DETROIT III.—System, Marconi, 240.
- CITY OF MONTGOMERY.—Range, 300; system, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- CITY OF SAVANNAH.—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- CITY OF SEATTLE.—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Pacific Coast Steamship Co., owner of vessel.

- COAMO.**—System, Marconi, 1000; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- COLUMBIA (KRO).**—Strike out all particulars.
- COLUMBIA (WHC).**—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Henry Wilson, owner of vessel.
- COMUS (KKD).**—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- CORDOVA.**—Range, 100; system, Kilbourne & Clark, 120; service, PG; hours, N; rates, 4 c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by the Alaska Steamship Co., owner of vessel.
- CRETAN.**—Range, 150; system, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- DESPATCH.**—Hours, N.
- DORA.**—Range, 100; system, Kilbourne & Clark, 120; service, PG; hours, X; rates, 4c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by the Alaska Steamship Co., owner of vessel.
- EDITH.**—Strike out all particulars.
- EDWARD L. DOHENY.**—System, Marconi, 1000; W. L., 300, 475, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- ESPERANZA.**—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- GEORGIA (WFA).**—System, Marconi, 240.
- GRECIAN.**—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- GUARDIAN.**—Hours, X.
- HAVANA.**—Range, 300; system, Marconi, 1000; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- HONOLULAN.**—Hours, X.
- INDIAN (KQI).**—Strike out all particulars.
- INDIANA (WFC).**—Range, 100; system, Marconi, 240.
- JAMESTOWN.**—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- JOHN A. HOOPER.**—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. John A. Hooper Co., owner of vessel.
- KERSHAW.**—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- LEXINGTON (KQL).**—Strike out all particulars.
- LYDONIA.**—System, Marconi, 240.
- MABOWJNE.**—Strike out all particulars.
- MASCOTTE.**—System, Marconi, 200; W. L., 300, 600. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Peninsular & Occidental Steamship Co., owner of vessel.
- MEXICO.**—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- MIAMI (KOZ).**—System, Marconi, 240; W. L., 300, 600. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Peninsular & Occidental Steamship Co., owner of vessel.
- MISSOURI (WFX).**—System, Marconi, 240. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Northern Michigan Transportation Co., owner of vessel.
- NORTH STAR (KYZ).**—Strike out all particulars.
- OLEUM.**—Note, Union Oil Co., owner of vessel.
- PARTHIAN.**—Strike out all particulars.
- PURITAN.**—Range, 100; system, Marconi, 240.

- QUANTICO.**—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- RELIEF.**—Range, 75; system, De Forest, 120; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Merritt & Chapman Derrick & Wrecking Co., owner of vessel.
- ROAMER.**—Range, 100; system, Marconi, 1000; W. L., 300, 450, 600; service, PG; hours, X; rate, 4 c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by the State of Florida (shellfish commission), owner of vessel.
- SAN JACINTO.**—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- SANTA MARIA (WTF).**—Note, Santa Maria Steamship Co., owner of vessel.
- SANTA RITA (WTG).**—Range, 100; system, Marconi, 400; service, PG; hours, X.
- SARATOGA (KWS).**—Range, 300; system, Marconi, 1000; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- SAYONARA.**—Range, 200; system, Marconi, 600; W. L., 300, 600.
- SEEANDBEE.**—System, Marconi, 240; hours, X.
- SOUTH AMERICAN.**—Strike out system. Note, The Texas Co., owner of vessel.
- STANDARD.**—Note, Standard Oil Co. of New Jersey, owner of vessel.
- TIONESTA.**—System, Marconi, 240.
- TUSCAN.**—Strike out all particulars.
- UMATILLA.**—System, Marconi, 480. Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Pacific Coast Steamship Co., owner of vessel.
- VIGILANCIA.**—Notes, Radio station operated and controlled by the Marconi Wireless Telegraph Co. of America. Walker, Armstrong & Co., owner of vessel.
- WHITTIER.**—Note, Union Transportation Co., owner of vessel.
- YUCATAN.**—Range, 100; system, Marconi, 480.
- ZULIA.**—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KIZ, *read* Brooks, Alaska c; **KYE**, *read* Casiana b; strike out particulars following the call signals **KDR**, **QQB**, **QKI**, **QQL**, **QQP**, **QQT**, **KRO**, and **WAE**.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, only.]

BOSTON, MASS. (1XH).—Strike out all particulars.

WATCHAUG POND, R. I.—W. L., 200, 300, 425, 600; service, P; hours, X.

MISCELLANEOUS.

SIGNAL CORPS RADIO STATION CHANGES.

The Signal Corps station at Nome, Alaska, now maintains continuous service and the station at Fort Worden, Wash., is now open to general public service. The Signal Corps station at Fort St. Michael, Alaska, has been discontinued as an examination point where operators may secure licenses.

COMMERCIAL EXTRA FIRST-GRADE OPERATORS.

The names of the following operators have been added to the list of those to whom commercial extra first-grade licenses have been issued by the Secretary of Commerce as a reward for long and efficient service: John W. Lee, Philadelphia, Pa., and Robert Boyd Black, San Francisco, Cal.

THE PROVED VALUE OF RADIO TO VESSELS IN DISTRESS.

During the fiscal year 1915 the radio inspectors of the Bureau reported 26 cases of vessels leaving our ports which met with accident or disaster, requiring the use of wireless to summon assistance. Four of these were from fire; 12 were from running ashore, stranding, or getting into an ice jam; 3 were from the breakage of machinery; 4 resulted from collisions; 1 from shifting of cargo; 1 vessel was storm-battered and water-logged; and 1 was torpedoed. Excepting in the case of the *Lusitania*, which was torpedoed, the assistance thus rendered resulted in but two lives being lost. Since the close of the fiscal year the following disasters have occurred:

On September 13, 1915, the Fabre Line steamship *Sant' Anna*, bound from New York to Naples with 1,700 Italian reservists and crew aboard, caught fire in mid-ocean and all persons on board were saved. The SOS call brought the steamship *Ancona* to the assistance of the disabled vessel and 600 persons were taken off. The *Sant' Anna* then proceeded to port, convoyed by the *Ancona*, and the entire 1,700 passengers and crew saved.

Six days after the *Sant' Anna* disaster, the Greek liner *Athinai*, bound from New York to Piraeus, caught fire in mid-ocean and was abandoned by the passengers and crew, numbering 470. The call for assistance was answered by the steamships *Tuscania* and *Roumanian Prince*; 341 persons were taken on board the *Tuscania*, the remaining 129 being taken off by the *Roumanian Prince*. The vessel was entirely destroyed.

The use of radio apparatus on vessels carrying passengers, or with 50 or more crew, is now accepted as essential to the safety of those on board, and the report of the *Athinai* shows conclusively that many persons might have been lost and perhaps the cause of the disaster never known had not this vessel been equipped with radio apparatus.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, November, 1915—No. 11

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the List of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
E. F. SWEET,
Acting Secretary.

NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Longitude and latitude (approximate).	Call signal.	Range.	System.	Wave lengths.
Great Lakes, Ill.*, ¹ , ²	O 87° 50' 00"	NAJ	800	U. S. Navy..	300, 600, 1000
	N 42° 18' 30"				
Heald Bank Lightship **, ⁴	O 94° 13' 00"	NLP	60	.....do.....	300, 600
	N 29° 08' 00"				
Indianhead, Md.*, ⁵	O 77° 10' 55"	NBG	.....	.....do.....	300, 600, 750
	N 38° 38' 00"				
Steamship Premier ⁶ , ⁷	O 158° 28' 00"	KMP	20	.....	300, 450, 600
	N 58° 45' 00"				

* Radio station operated and controlled by the United States Naval Radio Service, Radio, Va.

¹ Great Lakes training station.

² Service, O; hours, X.

³ Off Galveston, Tex.

⁴ Service, O; hours, 8m 10s.

⁵ Service, O; hours, every hour on half hour from 8.30m. to 4.30s.

⁶ Moored schooner.

⁷ Hours, X; radio station operated and controlled by the Alaska Packers' Association. The station is limited to correspondence with Nushagak and Clark's Point, Alaska.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Vessel.	Call signal.	System.	Wave lengths.	Service.	Hours.
General John M. Schofield ¹	WXW	U. S. Army.....	600	O	
Gold Shell ²	WIB	Marconi.....	300, 600	.....
Pioneer (WPM) ³	WPM	Kilbourne & Clark, 120.....	300, 600	PG	X
Tyee ⁴	WPC	Kilbourne & Clark, 120.....	300, 600	PG	X

¹ Radio station operated and controlled by the United States Signal Corps, War Department, Washington, D. C.

² Rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co. Gold Shell Steamship Co., owner of vessel.

³ Range, 100; rates, 4 c. per word, 40 c. minimum per radiogram. Radio station operated and controlled by the Puget Sound Tugboat Co., owner of vessel.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, only.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Battle Creek, Mich.....	8ZC	200, 425	P	X	Bert E. Clough.
Schenectady, N. Y. (2YU).....	2YU	300, 2000	P	X	Walter L. Upson (Union College).

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KMP	Premier.....c	WIB	Gold Shell.....b
NAJ	Great Lakes, Ill.....c	WPC	Tyee.....b
NBG	Indianhead, Md.....c	WPM	Pioneer.....b
NLP	Heald Bank Lightship.....c	WXW	General John M. Schofield.....b

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

- Name =Name of station.
 G. loc. =Geographical location: O=west longitude, N=north latitude.
 Call =Call letters assigned.
 System =Radio system used and sparks per second.
 Range =Normal range in nautical miles.
 W. L. =Wave lengths assigned: Normal wave length in *italics*.
 Service =Nature of service maintained:
 PG=General public.
 PR=Limited public.
 P=Private.
 O=Government business exclusively.
 Hours =Hours of operation:
 N=Continuous service.
 X=No regular hours.
 m=a. m. (12m=midday).
 s=p. m. (12s=midnight).
 Rates =Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent).
 Notes =Refer to notes in the Berne list.

OTHER ABBREVIATIONS.

Marconi Co.=Marconi Wireless Telegraph Co. of America.

ALTERATIONS AND CORRECTIONS.**SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.**

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the List of Radiotelegraph Stations, published by the Berne bureau.]

- ADMIRAL EVANS.—Range, 100; system, Kilbourne & Clark, 120; hours, N; strike out rates. Note, Radio station operated and controlled by the Pacific-Alaska Navigation Co., owner of vessel.
 ANTILLES.—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
 BATON ROUGE.—System, Marconi, 1000.
 BRINDILLA.—System, Marconi. Notes, Radio station operated and controlled by the Marconi Co. Standard Oil Co. of New Jersey, owner of vessel.
 CADDO.—System, Marconi, 1000. Notes, Radio station operated and controlled by the Marconi Co. Standard Oil Co. of New Jersey, owner of vessel.
 CAMAGUEY.—Range, 300; system, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
 CAROLINA (KGB).—Range, 300; system, Marconi, 1000; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
 CITY OF BUFFALO.—Hours, X.
 CITY OF MACON.—Range, 300; system, Marconi, 1000.
 CITY OF ST. LOUIS.—Range, 300; system, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
 COMMUNIPAW.—System, Marconi.
 COPPENAME.—Range, 500.
 CROFTON HALL.—System, Marconi, 1000; W. L., 300, 450, 600; hours, N.
 CUSHING (KSC).—System, Marconi. Notes, Radio station operated and controlled by the Marconi Co. Standard Oil Co. of New Jersey, owner of vessel.

- CYPRUS.**—Service, P; strike out rates. Note, Radio station operated and controlled by Daniel C. Jackling, owner of vessel (yacht).
- DAYTON.**—System, Marconi. Notes, Radio station operated and controlled by the Marconi Co. Standard Oil Co. of New Jersey, owner of vessel.
- DIAMOND HEAD.**—Strike out all particulars.
- ESSEX (KQE).**—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- EXCELSIOR (KKO).**—Range, 300; system, Marconi, 1000; W. L., 300, 465, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- FAVORITE.**—System, Marconi, 240.
- GLENPOOL.**—System, Marconi, 1000. Notes, Radio station operated and controlled by the Marconi Co. Standard Oil Co. of New Jersey, owner of vessel.
- HERBERT G. WYLIE.**—Range, 200; system, Marconi, 1000; service, PG; hours, X.
- HEREDIA.**—System, National Electric Signaling Co., 1000.
- JUNIATA (KQJ).**—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- KOREA.**—Notes, Radio station operated and controlled by the Marconi Co. Atlantic Transport Co., owner of vessel.
- LAMPASAS.**—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- LOUISIANA (KUL).**—Range, 300; system, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- MARACAIBO.**—Range, 300; system, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- MERRIMACK.**—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- MOMUS.**—Range, 300; system, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- MORENI.**—System, Marconi, 1000.
- MORRO CASTLE.**—Range, 300; system, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- NAVAJO (WNJ).**—Range, 150; system, Marconi, 480; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- NORWOOD.**—Strike out all particulars.
- OLIVETTE.**—W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- ONTARIO (KQO).**—Range, 150; system, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- PERSIAN.**—System, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- PHILADELPHIA (KDA).**—Range, 300; system, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- PIONEER.**—System, Marconi, 1000; hours, X. Notes, Radio station operated and controlled by the Marconi Co. Standard Oil Co. of New Jersey, owner of vessel.
- POLARINE.**—System, Marconi, 1000. Note, Radio station operated and controlled by the Marconi Co. Standard Oil Co. of New Jersey, owner of vessel.
- SABINE.**—Range, 300; system, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- SAN JUAN (KGJ).**—Range, 300; system, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- STATE OF OHIO.**—System, Marconi, 120.

SUWANNEE.—Range, 150; system, Marconi, 1000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

S. V. LUCKENBACH.—Name, Onega. Note, Radio station operated and controlled by the Marconi Co. Barber & Co., owner of vessel.

TILlicum.—Strike out all particulars.

WILLIAM O'BRIEN.—Range, 200; system, Marconi, 240; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KGU, read, Onega, b. Strike out particulars following the call signals WNL, WSG, and WPT.

MISCELLANEOUS.

LIST OF RADIO STATIONS OF THE UNITED STATES.

The Bureau announces the completion of the 1915 edition of the List of Radio Stations of the United States, containing a list of 5,073 stations. The table given below shows the number of land, ship, special land, and amateur stations contained in this list as compared with the 1914 list:

Station.	1914	1915	Increase.
Government and commercial land stations.....	189	224	35
Government and commercial ship stations.....	895	895	.....
Special land stations.....	54	118	64
General and restricted amateur stations.....	2,796	3,836	1,040
Total.....	3,934	5,073	1,139

The appendix to this list contains several articles of interest to radio operators. These books may be procured from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 15 cents per copy.

Copies of the Radio Communication Laws and Regulations of the United States may also be procured from the Superintendent of Documents at 15 cents per copy.

INTERNATIONAL LIST OF RADIOTELEGRAPH STATIONS.

The Director of the International Bureau of the Telegraph Union, Berne, Switzerland, has announced the completion of the fourth French edition of the Official Nomenclature of Radiotelegraph Stations of the World. The English and German editions of this list are now in the hands of the printer and will be available within a very short time.

CASUALTY REPORT.

The steamship *Mariposa*, of the Alaska Steamship Co., bound from Seattle, Wash., to southern Alaskan ports, grounded at 4.36 a. m., October 6, on the rocky shore off Pointer Island, Llama Passage, about 8 miles from the Indian village of Bella Bella, British Columbia.

SOS signals were transmitted at 4.40 a. m., and were answered by the steamship *Despatch*, of the Border Line Transportation Co., 30 miles distant, the steamship *Senator* of the Pacific Coast Co., 270 miles distant, and the Canadian land station at Triangle Island, British Columbia, approximately 150 miles distant.

The *Despatch* immediately hastened to the scene of the disaster, and after taking off all persons on board the *Mariposa*, remained near by until she could be of no further assistance.

The distress call was transmitted on the emergency radio equipment of the vessel, which was installed on the main deck and which remained above water for six hours, when the vessel slid into deeper water and the apparatus was submerged by the rising tide.

TAHITI RADIO STATION.

The radio station now being built by the French Government on Tahiti Island, Society Islands, will be ready to receive and transmit commercial messages before the close of 1915.

The temporary station, now in course of erection, will be followed by a much more powerful plant. The plans of the temporary station contemplate a 10-kilowatt installation of the type used by the French Government, with a wave length of 600 meters. The towers, two in number, will be 100 meters in height. The station will be expected to reach Awanui, New Zealand; Suva, Fiji; and the Samoan Islands.

Immediately upon the completion of the temporary station, work will begin on a permanent station of much greater power. This permanent 300-kilowatt station will be operated by a 500-horsepower gasoline engine, and will use a wave length of 2500 meters. There will be eight towers, each 100 meters high, erected in parallel rows of four towers. The space between the towers will be 250 meters, and 200 meters between parallels. There will be two antennæ, one of 600 meters wave length, the other of 2500 meters.

With the permanent station it is expected that communication will be established with stations in Cochin-China; South America; Honolulu, Hawaii; San Francisco, Cal.; Sydney; Australia; and even in Martinique and Guadeloupe, West Indies. All material used in the construction of these stations is supplied by the French Government and is shipped from France.

Call letters have not been assigned to the station and rates are not obtainable at the present time.

TEST OF AUXILIARY RADIO EQUIPMENT.

[Test of an Edison storage battery, type B-4-H, W. S., consisting of 100 cells rated at 80 ampere-hour capacity, used as an auxiliary source of power supply for a radio transmitter of the Marconi Wireless Telegraph Co. of America, known as the type P-5, one-half kilowatt (input to transformer primary), 500 cycle, quenched and rotary synchronous gaps. Height of antenna above lead line, 95 feet; fundamental wave length, 293 meters.]

Because of the difference of opinion and the absence of any official information as to whether or not certain types of auxiliary apparatus and their source of auxiliary power supply fully comply with section 1 of the act of June 24, 1910, amended July 23, 1912, the Department believes it to be necessary that the various types of apparatus and auxiliary power be officially submitted to a test from time to time, which will furnish the information desired. In view of the above, the Department authorized that such a test be conducted in connec-

tion with the auxiliary equipment installed aboard the Merchants & Miners' Transportation Co.'s steamship *Howard*, plying between Baltimore, Norfolk, and Boston.

This test was conducted from July 13 to 19, 1915, en route from Norfolk to Boston and return from Boston to Baltimore by F. A. Kolster, of the Bureau of Standards, and R. Y. Cadmus, radio inspector, of the Bureau of Navigation, assisted by representatives of the Edison Storage Battery Co. and the Marconi Wireless Telegraph Co. of America.

The Edison battery installed on the steamship *Howard* consists of 100 cells type B-4-H, W. S., rated at 80 ampere hours. This battery supplies power to run a 110-volt motor, which drives the one-half kilowatt, 500-cycle generator of the radio transmitting equipment, and also supplies power for 25 or more deck lights, as illustrated in figure 1.

The voltage of the battery when fully charged is 140. It is necessary, therefore, to have a resistance in series with the battery in order to cut down the voltage at the terminals of the motor to 110. The

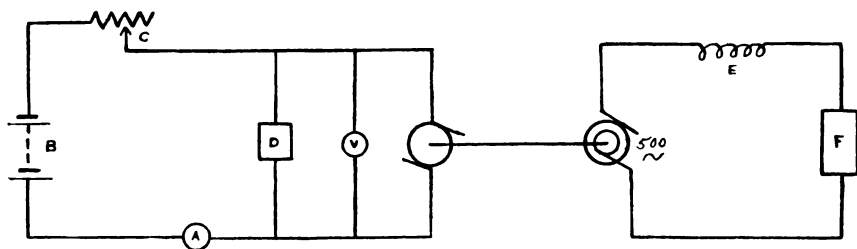


FIG. 1.

A, ammeter; B, 100-cell storage battery; C, variable resistance; D, deck lights; E, reactance; F, 500-watt load; V, voltmeter.

resistance supplied for this purpose is adjustable so that as the battery voltage gradually drops the voltage at the motor terminals can be kept at 110 by decreasing this resistance.

The first test of the battery was started at 6.20 p. m. on July 15, after the battery had been given an overcharge, as recommended by the representative of the Edison company who was present at the tests.

The test was conducted in the following manner: An artificial load of 500 watts was connected to the 500-cycle generator and a bank of about 25 lights was connected to the battery, these lights representing the deck lights proposed in case of emergency. An automatic sending key was connected in the generator circuit so that the load could be thrown on intermittently, as when sending at the rate of 15 to 20 words per minute. The curve shown in figure 2 indicates the behavior of the battery during the time of this test.

The arrangement of 100 cells gave an initial voltage of 140, a series resistance being used to reduce this voltage to 110, which is the voltage for which the motor is designed. This arrangement makes it possible to maintain the required voltage of 110 over a considerable length of time by adjusting the series resistance.

This arrangement is open to criticism, however, because of the fact that it is possible, through carelessness or otherwise, to throw the

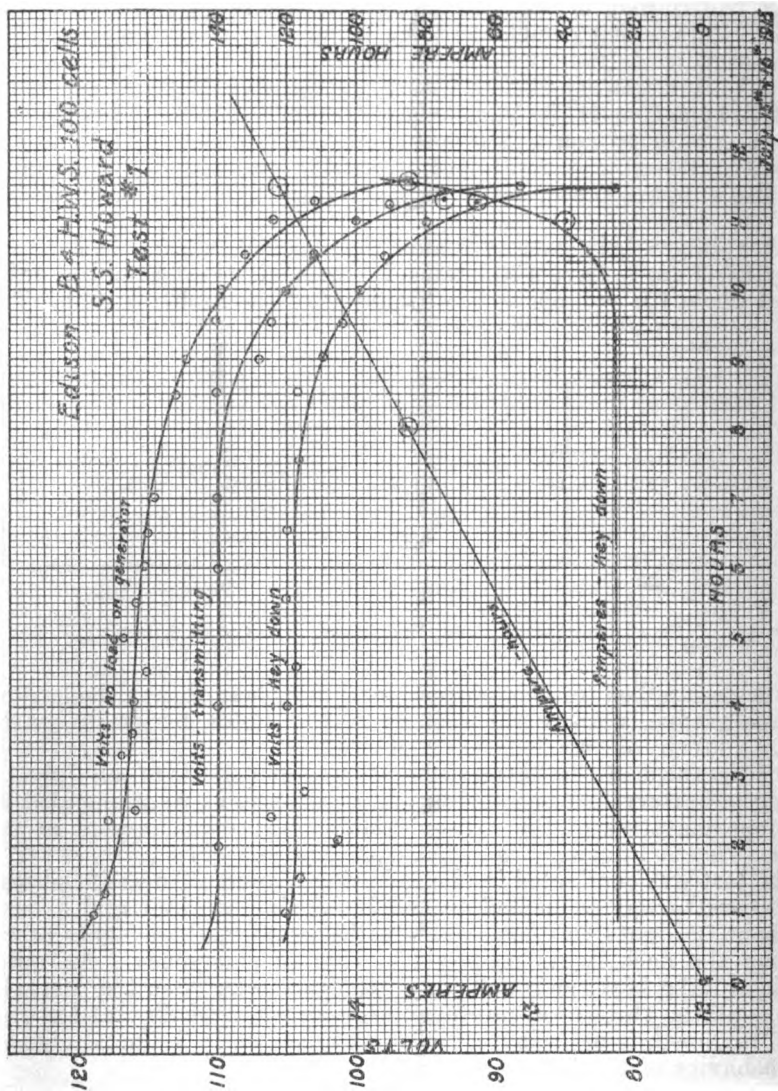


FIG. 2.

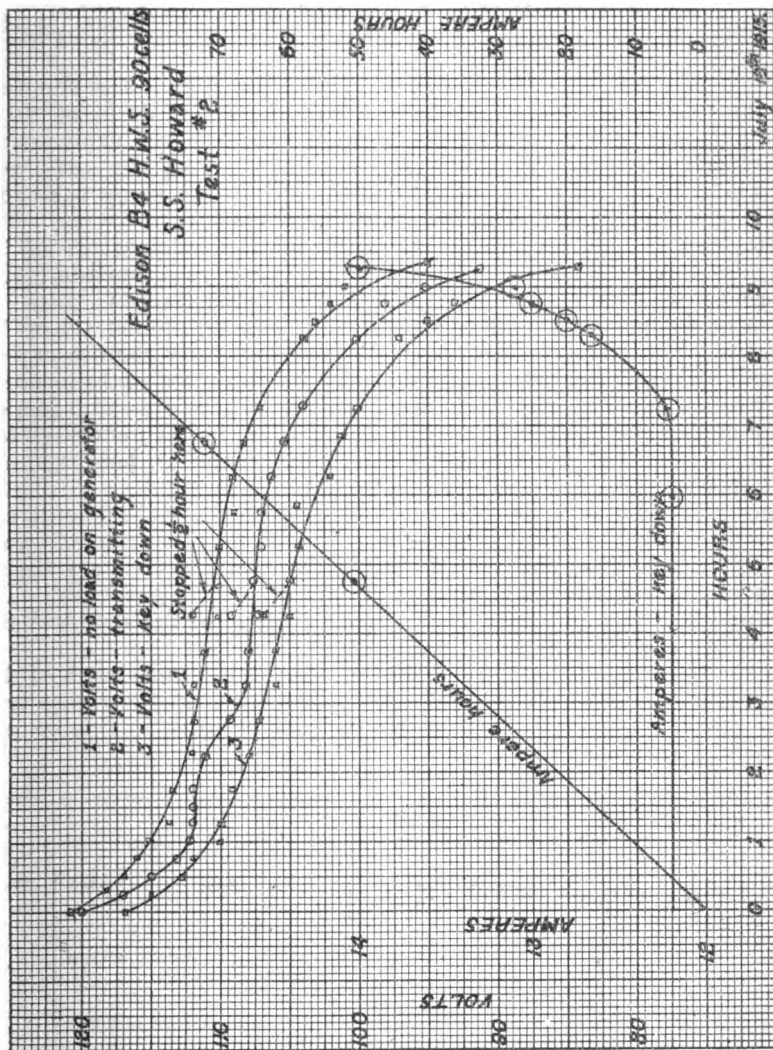


FIG. 3.

entire 140 volts across the motor terminals, in which case the motor would probably be burned out.

A second test of the battery was therefore made on July 18, using only 90 cells instead of 100 cells. The initial voltage of these 90 cells after charge was about 125. No resistance was used in series and the voltage across the motor terminals was not sufficiently in excess of 110 during the first part of the test to cause any motor trouble. The curve shown in figure 3 indicates the behavior of the battery during the time of this test.

It will be noted that the 90-cell battery apparently meets the four-hour and six-hour service requirements of the act of June 24, 1910, amended July 23, 1912, and the London International Convention, respectively, particularly when it is considered that the tests were made under continuous sending conditions, no time being taken for receiving.

Although at no time during the tests did the temperature of the electrolyte show an excessive rise, it has been recommended that proper ventilation be provided in battery compartments.

The motor generator set furnished with this equipment is of the inductor type. Small motor generator sets generally require careful attention, and since these machines must be depended upon in emergency cases frequent inspection is necessary. Therefore radio inspectors should make a careful examination of these motor generator sets at each inspection, particularly of the motor brushes, bearings, and oil chambers.

The radio transmitter furnished is of modern design, efficient, and easily operated. Provision has been made for the use of wave lengths of 300, 450, and 600 meters. The transmitter may be set for any of these wave lengths by means of a simple switch. The antenna current was found to be about 6 amperes for 450 and 600 meters and about 4 amperes for 300 meters.

Under these conditions it is believed that the requirement of 100 miles communication will be fulfilled, as indicated in the range tests given below, conducted while en route from Norfolk to Boston and return to Baltimore.

Date.	Time. ¹	Position of steamship Howard.	Receiving stations.	Distance in nautical miles.
1915.				
July 14...	4.55 a. m.	21 miles NE. of Winter Quarter Light.	Virginia Beach, Va.....	105
July 14...	5.00 a. m.	22 miles NE. of Winter Quarter Light.	S. S. Juniata, 3 miles NE. of Cape Charles.	110
July 14...	5.27 a. m.	28 miles NE. of Winter Quarter Light.	Cape Hatteras, N. C.....	211
July 14...	5.45 a. m.	33 miles NE. of Winter Quarter Light.	S. S. Juniata, abreast of Smith Island.	101
July 14...	6.22 a. m.	42 miles NE. of Winter Quarter Light.	S. S. Juniata, off Virginia Capes...	117
July 14...	4.00 p. m.	7 miles E. of Fire Island.....	S. S. Gloucester, lat. 39° 12' N., long. 73° 27' W.	87
July 15...	9.00 a. m.	5 miles NNE. of Sluce Lightship..	Nantucket Lightship.....	83
July 18...	5.15 a. m.	Off Cape Henry.....	S. S. Juniata, 18 miles NE. of Winter Quarter Light.	100
July 18...	5.45 a. m.	.....do.....	S. S. Juniata, 25 miles NE. of Winter Quarter Light.	107
July 18...	6.45 a. m.	Near Old Point Comfort.....	S. S. Juniata, 40 miles NE. of Winter Quarter Light.	127
July 18...	7.00 a. m.	.....do.....	S. S. Powhatan, off Sparrows Point	160

¹ Weather clear, static medium, during all tests.

The receiving apparatus is of modern type and much more efficient than the older types. It has been recommended that means be provided in these receivers for connecting the detector and telephones in the antenna or primary circuit for "listening in" purposes, and the inductance position with the series condenser short circuited should be plainly marked for 600 meters. This would enable the operator more quickly to hear calls without disturbing the secondary circuit of his receiver and the coupling position of his coils.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, December, 1915—No. 12

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, January 14, 1916.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the List of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:

E. F. SWEET,
Acting Secretary.

NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name.	Call signal.	System.	Wave lengths.	Service.	Hours.
Fort Constitution, N. H. ¹	WZE	U. S. Army.....	825	O	X
Fort Dade, Fla. ¹	WZK	.....do.....	825	O	X
Fort Moultrie, S. C. ¹	WZF	.....do.....	825	O	X

¹ Radio station operated and controlled by the United States Signal Corps, War Department, Washington, D. C.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Name.	Call signal.	System.	Wave lengths.	Service.	Hours.
Alaska ¹	WWS	Kilbourne & Clarke, 240...	300, 450, 500, 800	PG	X
Edna ²	WSP	.....	.....	.....	.....
Galatea ³	WGF	Marconi.....	300, 800	.....	.....
Mackinaw ⁴	WHW	Halcun, 240.....	300, 800	PG	X
Nevada ⁵	WFD	.....	300, 800	.....	.....
North America ⁶	KRU	Composite.....	300, 800	PG	X
Orleanian ⁷	KON	Marconi.....	300, 800	.....	.....
Pacific.....	WRD	.....	300, 800	.....	.....

¹ Range, 100; rates, 4 c. per word 40 c. minimum per radiogram. Radio station operated and controlled by the Alaska Steamship Co., owner of vessel.

² Sudden & Christensen, owner of vessel.

³ Radio station operated and controlled by the Marconi Co. E. L. Ford, owner of vessel.

⁴ Range, 500; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by George and James Flood, owners of vessel.

⁵ Goodrich Transit Co., owner of vessel.

⁶ Rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Radio station operated and controlled by the Merritt & Chapman Derrick and Wrecking Co., owner of vessel.

⁷ R. Lawrence Smith (Inc.), owner of vessel.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, only.]

Name.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Lexington, Ky.....	9YL	500, 1800	P	X	Otto Holstein (Co. A, Signal Corps, Ky. N. G.).
Marion, Ohio.....	8ZD	200, 425	P	X	Keith Henney.
New Braunfels, Tex.....	5ZB	200, 450	P	X	Arthur E. Mollenhauer.
San Jose, Cal.....	6XF	300, 600, variable	P	X	Charles D. Herrold.
Wayne, Nebr.....	9YT	300, 425	P	X	U. S. Conn, president State Normal School.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KON	Orleanian.....b	WSP	Edna.....b
KRU	North America.....b	WWS	Alaska.....b
WFD	Nevada.....b	WZE	Fort Constitution, N. H.....c
WGF	Galatea.....b	WZF	Fort Moultrie, S. C.....c
WHW	Mackinaw.....b	WZK	Fort Dade, Fla.....c
WRD	Pacific.....b		

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
5ZB	Fifth district: New Braunfels, Tex.	8ZD	Eighth district: Marion, Ohio.
6XF	Sixth district: San Jose, Cal.	9YL	Ninth district: Lexington, Ky.
		9YT	Wayne, Nebr.

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

- Name =Name of station.
 G. loc. =Geographical location: O=west longitude, N=north latitude.
 Call =Call letters assigned.
 System =Radio system used and sparks per second.
 Range =Normal range in nautical miles.
 W. L. =Wave lengths assigned: Normal wave length in italics.
 Service =Nature of service maintained:
 PG=General public.
 PR=Limited public.
 P=Private.
 O=Government business exclusively.
 Hours =Hours of operation:
 N=Continuous service.
 X=No regular hours.
 m=a. m. (12m=midday).
 s=p. m. (12s=midnight).
 Rates =Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)
 Notes =Refer to notes in the Berne list.

OTHER ABBREVIATIONS.

Marconi Co.=Marconi Wireless Telegraph Co. of America.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

CHICAGO, ILL. (WGO).—Hours, 7m–6s, 8s–7m.

EAST SAN PEDRO, CAL.—Notes, Radio station operated and controlled by the Marconi Co. The station also communicates with Avalon, Cal. For radiotelegrams exchanged with the ships *Hermosa* and *Cabrillo*, 2 c. per word 20 c. minimum per radiogram (address and signature free of charge). For radiotelegrams exchanged with Avalon, Cal., 3 c. per word 30 c. minimum per radiogram.

GRAND HAVEN, MICH.—Hours, 7m–11m, 8s–11s.

JACKSONVILLE, FLA.—Range, 200; system, Marconi, 240.

LUDINGTON, MICH.—Hours, 7m–11m, 12m–6s, 8s–1m, 2m–7m, when lake is open to navigation.

MANITOWOC, WIS.—Hours, 8m–11.30m, 2.30s–6s, 7.30s–8.30s, time of the meridian 90° west of Greenwich.

MILWAUKEE, Wis.—Hours, 8m–12m, 1s–5m.

SAVANNAH, GA.—W. L., 300, 550, 600.

SEA GATE, N. Y.—Range, 200; system, Marconi, 1000.

SEATTLE, WASH. (KPA).—Range, 250; system, Marconi, 1000; W. L., 300, 540, 600, 1700, 3100; service, PG and limited commercial. Note, Radio station operated and controlled by the Marconi Co.

UNDERWOOD, WASH.—G. loc. (approximate), 0 45° 45' 00'', N. 121° 32' 00''; range, 75; system, composite, 400; W. L., 300, 600, 1700; hours, X.

VIRGINIA BEACH, VA.—Range, 200; system, Marconi, 480.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

ADMIRAL EVANS.—Range, 250.

ADMIRAL WATSON.—Strike out all particulars.

ALAMO.—System, Marconi, 1,000; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

ALLIANCE.—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

ANN ARBOR No. 3.—Hours, X.

ANN ARBOR No. 4.—Hours, X.

ANN ARBOR No. 5.—Hours, X.

ANTILLA.—Range, 300; system, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

ATENAS.—System, National Electric Signaling Co., 1,000.

CAMDEN.—System, Marconi, 400; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

CARLOS.—Range, 500; system, Halcun, 240; W. L., 300, 500, 600. Note, Radio station operated and controlled by the Olson & Mahony Steamship Co., owner of vessel.

CHINA.—Notes. Radio station operated and controlled by the Marconi Co. China Mail Steamship Co., owner of vessel.

CITY OF ALPENA II.—System, Kilbourne & Clark, 120; W. L., 300, 450, 500, 600. Note, Radio station operated and controlled by the Detroit & Cleveland Navigation Co., owner of vessel.

CITY OF AUGUSTA.—Range, 300; system, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

CITY OF DETROIT II.—System, Kilbourne & Clark, 120; W. L., 300, 450, 500, 600; hours, X. Note, Radio station operated and controlled by the Detroit & Cleveland Navigation Co., owner of vessel.

CITY OF GRAND RAPIDS.—Hours, X.

CITY OF MACKINAC II.—System, Kilbourne & Clark, 120; W. L., 300, 450, 500, 600. Note, Radio station operated and controlled by the Detroit & Cleveland Navigation Co., owner of vessel.

CITY OF St. IGNACE.—System, Kilbourne & Clark, 120; W. L., 300, 450, 500, 600. Note, Radio station operated and controlled by the Detroit & Cleveland Navigation Co., owner of vessel.

CONGRESS.—Range, 150; system, Marconi, 480.

CORNING.—System, Marconi. Notes, Radio station operated and controlled by the Marconi Co. Standard Oil Co. of New Jersey, owner of vessel.

CREOLE.—Range, 300; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

DE SOTO.—System, Marconi. Notes, Radio station operated and controlled by the Marconi Co. Standard Oil Co. of New Jersey, owner of vessel.

FORT BRAGG.—Strike out all particulars.

FRIEDA.—Strike out all particulars.

GOVERNOR.—System, Marconi, 480.

GRACE DOLLAR.—Range, 100; system, Marconi, 480.

HOLLAND (WDW).—Hours, X.

HUMBOLDT.—System, Marconi, 240.

- MANCHURIA.—Notes, Radio station operated and controlled by the Marconi Co. Atlantic Transport Co., owner of vessel.
- MARIPOSA.—Strike out all particulars.
- MONGOLIA.—Notes, Radio station operated and controlled by the Marconi Co. Atlantic Transport Co., owner of vessel.
- MUSKOGEE.—System, Marconi. Notes, Radio station operated and controlled by the Marconi Co. Standard Oil Co. of New Jersey, owner of vessel.
- NACOOCHEE.—Range, 300; system, Marconi, 1,000.
- NORTHLAND (WNX).—Strike out all particulars.
- ONEGA.—Hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- PARAISO.—Range, 200; system, Marconi, 480.
- PARISMINA.—System, National Electric Signaling Co., 1,000.
- PERE MARQUETTE.—W. L., 300, 500, 600; hours, X; service, limited commercial; strike out rates. Notes, Radio station operated and controlled by the Marconi Co. Pere Marquette Railroad Co., owner of vessel.
- PERE MARQUETTE 17.—W. L., 300, 500, 600; service, limited commercial; hours, X; strike out rates. Notes, Radio station operated and controlled by the Marconi Co. Pere Marquette Railroad Co., owner of vessel.
- PERE MARQUETTE 18.—W. L., 300, 500, 600; service, limited commercial; hours, X; strike out rates. Notes, Radio station operated and controlled by the Marconi Co. Pere Marquette Railroad Co., owner of vessel.
- PERE MARQUETTE 19.—W. L., 300, 500, 600; service, limited commercial; hours, X. Notes, Radio station operated and controlled by the Marconi Co. Pere Marquette Railroad Co., owner of vessel.
- PERE MARQUETTE 20.—W. L., 300, 500, 600; service, limited commercial; hours, X. Notes, Radio station operated and controlled by the Marconi Co. Pere Marquette Railroad Co., owner of vessel.
- PETROLITE.—System, Marconi, 1,000. Notes, Radio station operated and controlled by the Marconi Co. Standard Oil Co. of New Jersey, owner of vessel.
- PRESIDENT.—System, Marconi, 240. Notes, Radio station operated and controlled by the Marconi Co. Pacific Coast Steamship Co., owner of vessel.
- PRINCETON (KST).—System, Marconi, 1,000. Notes, Radio station operated and controlled by the Marconi Co. Standard Oil Co. of New Jersey, owner of vessel.
- PROTEUS (KKP).—Range, 300; system, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- SAN MATEO.—Range, 300; system, Wireless Specialty Apparatus Co., 1,000; service, PG; hours, X; rate 8 c. per word 80 c. minimum per radiogram. Notes, Radio station operated and controlled by the Tropical Radio Telegraph Co. San Mateo Steamship Corporation, owner of vessel.
- SIBERIA.—Notes, Radio station operated and controlled by the Marconi Co. Atlantic Transport Co., owner of vessel.
- SILVER SHELL.—Range, 400; system, Marconi, 1000; W. L., 300, 450, 600; service, PG; hours, X.
- SOUTH AMERICAN (KVW).—Strike out all particulars.
- VANADIS.—Note, Radio station operated and controlled by Morton F. Plant, owner of vessel (yacht).
- WESTERN STATES.—System, Kilbourne & Clark, 120; W. L., 300, 450, 500, 600. Note, Radio station operated and controlled by the Detroit & Cleveland Navigation Co., owner of vessel.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out particulars following the call signals KFF, KVW, WAW, WHP, WLH, and WNX.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, only.]

- BOSTON, MASS. (1XB).—Strike out all particulars.
- MONTGOMERY, ALA.—W. L., 500, 1650, 1800.
- SAN FRANCISCO, CAL. (6XH).—W. L., 300, 600, variable.
- ST. DAVIDS, PA.—W. L., 425, 500.

MISCELLANEOUS.**RADIO STATIONS OF THE UNITED STATES.**

[Nov. 1, 1915.]

Government, commercial, and special land stations.

Controlled by—	General public.		Limited public.		Limited commercial.		Government, official.		Special. ¹		Total.	
	1914	1915	1914	1915	1914	1915	1914	1915	1914	1915	1914	1915
United States Navy.....	23	21	.....	1	.....	.....	25	33	.....	.....	48	55
United States Army.....	7	9	.....	.....	.....	.....	32	39	.....	.....	39	48
Philippine insular government.....	6	6	.....	.....	.....	.....	.....	.....	.....	.....	6	6
Marconi Co.....	58	45	3	4	1	10	.....	.....	1	.....	62	60
National Electric Signaling Co.....	1	2	1	.....	1	1	.....	.....	.....	.....	3	3
Tropical Radio Telegraph Co.....	2	2	.....	.....	.....	.....	.....	.....	.....	.....	2	2
Federal Telegraph Co.....	.....	3	6	4	2	1	.....	.....	.....	.....	8	8
Mutual Telephone Co. (Ltd.).....	3	3	2	.....	.....	2	.....	.....	.....	.....	5	5
Unclassified ²	5	7	.....	3	9	32	2	2	54	127	70	171
Total.....	105	98	12	12	13	46	59	74	54	128	243	358

Ship stations.

Controlled by—	Number.		Controlled by—	Number.	
	1914	1915		1914	1915
United States Navy.....	248	228	Alaska Steamship Co.....	.....	12
United States Coast Guard.....	25	24	Standard Oil companies.....	.....	11
United States Army.....	34	51	Pacific-Alaska Navigation Co.....	.....	5
United States Department of Commerce.....	6	7	Federal Telegraph Co.....	.....	5
Marconi Co.....	330	367	Atlantic Communication Co.....	15	3
National Electric Signaling Co.....	19	20	Unclassified ²	197	120
Tropical Radio Telegraph Co.....	21	21	Total.....	895	895
American-Hawaiian Steamship Co.....	.....	21			

¹ Including experimental and special amateur.² Includes individually operated stations.*Amateur stations.¹*

District and headquarters.	Number.		District and headquarters.	Number.	
	1914	1915		1914	1915
1. Boston, Mass.....	374	542	7. Seattle, Wash.....	114	203
2. New York, N. Y.....	503	636	8. Cleveland, Ohio.....	456	785
3. Baltimore, Md.....	543	682	9. Chicago, Ill.....	172	515
4. Savannah, Ga.....	36	54	Total.....	2,796	3,836
5. New Orleans, La.....	36	56			
6. San Francisco, Cal.....	562	333			

¹ To July 1.

Summary.

Kind of station.	Number.		Kind of station.	Number.	
	1914	1915		1914	1915
Government land stations.....	93	109	Government land and ship stations.....	406	419
Private, commercial, and private special land stations.....	150	249	Private commercial and private special stations, land and ship.....	732	834
Total.....	243	358	Total.....	1,138	1,253
Government ship stations.....	313	310	Amateur stations.....	2,796	3,836
Private commercial and private ship stations.....	582	585	Grand total.....	3,934	5,069
Total.....	895	895			

LOS ANGELES AMATEURS REPORTED FOR VIOLATIONS.

During a recent visit of V. Ford Greaves, radio engineer of the Bureau, and Ellery W. Stone, assistant radio inspector at San Francisco, the following Los Angeles amateur radio stations were found to be operating in violation of the radio act, and the cases have been referred to the United States district attorney for prosecution:

Hadys Hancock, Venice Pier, Venice, Cal., was found to be using a wave length in excess of 200 meters; maximum penalty, \$100.

Richard White, 435 Oakland Avenue, Pasadena, Cal., operating an amateur station without a license and using improper call letters; maximum penalty, \$100 fine and imprisonment for not more than two months.

Ernest Underwood, 903 Commercial Street., Inglewood, Cal., using a wave length in excess of 200 meters; maximum penalty, \$100.

George Vodra, 211 South Avenue, Los Angeles, Cal., using an amateur sending station without either station or operator's license; maximum penalty, \$100 and imprisonment for not more than two months.

Stuart Dalton, 121 East Twenty-third Street, Los Angeles, Cal., using a wave length exceeding 200 meters; penalty, \$100.

Harry Blodgett, 1953 Bonsallo Avenue, Los Angeles, Cal., using a transmitting station for some time without station or operator's license; maximum penalty, \$100 fine and imprisonment for two months.

METHOD OF CORRECTING LIST OF RADIO STATIONS OF THE UNITED STATES.

The following method of keeping the List of Radio Stations of the United States up to date by means of the Radio Service Bulletin is published for the information and guidance of those concerned:

The blank pages provided at the back of the List of Radio Stations should be numbered from 1 to 24.

The list of new stations published in the Radio Service Bulletin should be cut out and pasted on one of these blank pages.

The names and call letters of new stations should then be written on the margin of the proper page in the main list, with an arrow indi-

cating the proper alphabetical position. Following the name and call letter should be written the number of the page at the back of the book on which the particulars regarding the new station appear. This constitutes an alphabetical index to new stations.

The names of new stations should be written in the main list under the heading "Land and ship stations, alphabetically by call signals," showing the proper call signals as published in the bulletin. All of the call signals allotted to the United States are published in the list and followed by blanks for this purpose.

As there is not space in the main list in which to write changes concerning particulars of stations, the tables of alterations and corrections published in the bulletin should be cut and pasted on the blank pages provided at the back of the List of Radio Stations in such a manner as to permit the reading of both sides of a sheet thus inserted. Following the name of the station in the List of Radio Stations, the particulars of which have been altered, should be written the number of the page in the back of the book on which the changes may be found. Where the alterations and corrections affect only the Berne list the reference note may be omitted. The names of stations which have been discontinued or dismantled should be crossed out on the main list.

Corrections or changes in call letters should be written in the List of Radio Stations under the proper heading.

AMENDMENTS.

The Radio Laws and Regulations of the United States, edition of July 27, 1914, are hereby amended as follows:

Page 66, paragraph 149, should read:

Amateurs should write to the nearest examining officer in their vicinity (see pars. 134-145) for Form 756 "Application for operator's license," and to the radio inspector in their vicinity for Form 762 "Amateur applicant's description of apparatus."

Foreign-born applicants for station licenses must submit satisfactory evidence of their citizenship.

Page 67, paragraph 156, add the following sentence:

Licenses will not be signed by examining officers until the oath of secrecy has been properly executed.

Page 67, paragraph 160, last sentence should read:

Licenses held by them must be submitted to the examining officer.

Page 67, paragraph 161, should read:

Radio operators who pass the examination for a higher-grade license are required to submit their existing licenses to examining officers to be marked "Canceled."

Page 67, paragraph 162, should read:

Expired or canceled licenses will be returned to the licensees, marked "Canceled" or "Expired" in red across their faces, provided the particulars on Form 756, submitted herewith, are found correct by the examining officer. The service record shown on the reverse side of the license must be transcribed on Form 756.

Page 70, paragraph 175, should read:

Whenever practicable, the radio inspector shall satisfy himself on his visit before the departure of a steamer subject to the act of June 24, 1910, as amended July 23, 1912, that the radio apparatus is efficient and in good working order within the meaning of the act. If the apparatus does not comply with the law, the radio inspector will furnish the master with the stub of Form 771 "inspection record" on which will be noted the particulars in which the apparatus does not comply with the law. Where apparatus is found to be in compliance with the law, the stub of Form 771 will not be detached.

Page 70, paragraph 176, should read:

Masters of vessels entering a port of the United States and expecting to leave under the act of June 24, 1910, as amended July 23, 1912, should file Form 753a "Radio declaration" (Appendix A) in duplicate with the customs officer at the time of entry. The customs officer will furnish one copy to the radio inspector in order that proper inspection of the radio equipment may be made before departure.

Page 70, paragraph 177, should read:

For each departure of a steamer under the act of June 24, 1910, as amended July 23, 1912, the master is required to furnish to the customs officer a certificate in the form of Appendix B (Form 753b) "Master's certificate of radio apparatus." Such certificates shall be retained in the files of the collectors of customs. The collector of customs will arrange for the collection of these certificates at all times.

Radio service Form 753a.

(To be submitted in duplicate)

RADIO SERVICE

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, January, 1916—No. 13

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DEPARTMENT OF COMMERCE,
BUREAU OF NAVIGATION,
Washington, January 14, 1916.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the List of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:

E. F. SWEET,
Acting Secretary.

19746—15

NEW STATIONS.

No. 13

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

Station.	Longitude and latitude (approximate).	Call signal.	Range.	System.	Wave lengths.
Anderson ¹.....	.....	WZM	.....	U. S. Army.....	.....
Buckroe ¹.....	.....	WZL	.....	do.....	.....
Colorado Springs, Colo. ²	O 104 50 00	KIY	70	Clapp-Eastham...	300,485
Fort Caswell, N. C. ³	N 38 48 00	WUT	.....	U. S. Army.....	325

¹ Service, 0; radio station operated and controlled by the U. S. Signal Corps, War Department, Washington, D. C. School ship, located at Fort Monroe, Va.

² Service, limited commercial; hours, X; radio station operated and controlled by Herbert C. Colburn.

³ Service, 0; hours, 6m.-10s.; radio station operated and controlled by the U. S. Signal Corps, War Department, Washington, D. C.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Vessel.	Call signal.	System.	Wave lengths.	Owner of vessel.
Dochra ^{*1}	KGL	Marconi...	300,600	La Plata Steamship Co.
Eurana.....	KJG	do.....	300,600	Walker, Armstrong & Co.
Munamar.....	KUI	Marconi...	300,600	Munson Steamship Line.
Orleanian ¹	KON	do.....	300,600	R. Lawrence Smith (Inc.).
Virginia (KFR) ^{*1}	KFR	do.....	300,600	Harby Steamship Co.

* Service, PG.

¹ Rates, North and South American service, 4c. per word 40c. minimum per radiogram, transoceanic service, 8c. per word 80c. minimum per radiogram. Radio station operated and controlled by the Marconi Co.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, only.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Cambridge, Mass.....	1XO	1 300,600	P	X	General Radio Co.
Fruitvale, Cal.....	6XN	1 300,600	P	X	National Wireless Telephone & Telegraph Co.
Hendon, Ohio.....	8ZG	200,425	P	X	Henry W. Campbell.
Norwalk, Ohio.....	8ZI	200,425	P	X	Roy C. Burr.
Shelton, Ohio.....	8ZO	200,425	P	X	Ross Gunn.
Salt Lake City, Utah.....	6ZV	200,300,425	P	X	Julian G. McCollom.
San Francisco, Cal.....	6XO	1 300,600	P	X	National Wireless Telephone & Telegraph Co.

¹ Variable.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KFR	Virginia.....b	KUI	Munamar.....b
KGL	Dochra.....b	WUT	Fort Caswell, N. C.....c
KIY	Colorado Springs, Colo.....c	WZL	Buckroe.....c
KJG	Eurana.....b	WZM	Anderson.....c
KON	Orleanian.....b		

SPECIAL LAND STATIONS GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
1XO	First district: Cambridge, Mass.		
6XN	Sixth district:	8ZG	Eighth district:
6XO	Fruitvale, Cal.	8ZI	Ironton, Ohio.
6ZV	San Francisco, Cal.	8ZO	Norwalk, Ohio.
	Salt Lake City, Utah.		Oberlin, Ohio.

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name =Name of station.

G. loc. =Geographical location: O=west longitude, N=north latitude.

Call =Call letters assigned.

System=Radio system used and sparks per second.

Range =Normal range in nautical miles.

W. L. =Wave lengths assigned: Normal wave lengths in italica.

Service=Nature of service maintained:

PG=General public.

PR=Limited public.

P=Private.

O=Government business exclusively.

Hours =Hours of operation:

N=Continuous service.

X=No regular hours.

m=a. m. (12m=midday).

s=p. m. (12s=midnight).

Rates =Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

Notes =Refer to notes in the Berne list.

OTHER ABBREVIATIONS.

Marconi Co.=Marconi Wireless Telegraph Co. of America.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

AVALON, CAL.—System, Marconi, 240; W. L., 300, 530, 600.

CAPE HATTERAS, N. C.—System, Marconi, 430; W. L., 300, 550, 600; service, PG and PR. Notes, Radio station operated and controlled by the Marconi Co. The station corresponds with a station at Virginia Beach, Va., when Weather Bureau's wire is out of order; rate, 1 c. per word 10 c. minimum per radiogram.

KAWAIIHAE, T. H.—Service, limited commercial; strike out rates.

LAHAINA, ISLAND OF MAUI, T. H.—Service, limited commercial; strike out rates.

LIHUE, ISLAND OF KAUAI, T. H.—Service, limited commercial; strike out rates.

OAKLAND, CAL.—Range, 150; system, Composite, 1,000.

PHILADELPHIA, PA. (WHE).—Range, 100; system, Marconi, 240; service, PG and limited commercial.

SAN LUIS OBISPO, CAL.—Strike out all particulars.

WAHIAWA, ISLAND OF OAHU, T. H.—Service, PG.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

- AL-KI.**—Range, 100; system, Marconi, 240.
BAYWAY.—System, Marconi, 1,000.
BRADFORD.—System, Marconi.
CHICAGO (WFI).—Hours, X.
CHRISTOPHER COLUMBUS.—Hours, X.
CITY OF ATLANTA.—System, Marconi, 1,000; W. L., 300, 450, 600.
COLORADO (KEA).—Strike out all particulars.
DACIA.—Strike out all particulars.
EASTLAND.—Strike out all particulars.
ELLINGTON.—Range, 40; system, Composite; W. L., 300, 600; service, 0; hours, 10m-10.30m, 9s-9.30s.
HILONIAN.—System, Marconi, 480.
IAQUA.—System, Marconi; Notes, Radio station operated and controlled by the Marconi Co. John A. McGregor, owner of vessel.
ILLINOIS (WCZ).—Hours, X.
LLAMA.—Strike out all particulars.
MINNESOTA (WEK).—Notes, Radio station operated and controlled by the Marconi Co. Northern Michigan Transportation Co., owner of vessel.
MOTANO.—System, Marconi, 1,000.
NANTUCKET.—Range, 150; system, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
NEVADA.—Range, 100; system, Kilbourne & Clark, 120; W. L., 300, 450, 500, 600; service, PG; hours, X; rate, 2 c. per word 20 c. minimum per radiogram. Note, Radio station operated and controlled by Goodrich Transit Co., owner of vessel.
NEW YORK (KSN).—System, Marconi, 480; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
PACIFIC (WRD).—Strike out all particulars.
PIONEER (WPM).—Call, WPN.
POWATAN (KQY).—Range, 150; system, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word, 40c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
ROMA (WTE).—Name, Tamesi; system, Marconi. Note, Freeport & Tampico Fuel Oil Transportation Corporation, owner of vessel.
SOMERSET (KSU).—System, Marconi, 1,000.
VIGILANCIA.—Notes, Radio station operated and controlled by the Marconi Co. Marine Transport Service Corporation, owner of vessel.
WINDOM.—Name, Comanche.
ZAPORA.—Note, Radio station operated and controlled by the Booth Fisheries Co., owner of vessel.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

NRW, *read* Comanche b; WTE, *read*. Tamesi b; strike out particulars following the call signals, KDN, KEA, KGD, KSI, WFN, and WRD.

MISCELLANEOUS.

LOS ANGELES AMATEURS REPRIMANDED AND PENALIZED.

Upon a recent inspection trip made by V. Ford Greaves, radio engineer of the Bureau, and Ellery W. Stone, assistant radio inspector at San Francisco, a number of amateurs were reported for violation of the fifteenth regulation of the act of August 13, 1912, for using a wave length in excess of 200 meters, and the following action in these cases has been taken by the Secretary of Commerce:

V. M. Bitz, 825 West Fifty-third Street, Los Angeles, Cal., licenses suspended.

Mark B. Cosby, 356 Hobart Avenue, Los Angeles, Cal., licenses suspended.
Stuart Dalton, 121 East Twenty-third Street, Los Angeles, Cal., penalty remitted.
Hady's Hancock, Venice Pier, Venice, Cal., fined.
Freeman High, 726 West Twenty-seventh Street, Los Angeles, Cal., licenses suspended.

Horace Kemper, 1734 Loma Drive, Los Angeles, Cal., fined.

Alfred McLaren, 534 West Forty-ninth Street, Los Angeles, Cal., licenses suspended.

Ernest Underwood, 903 Commercial Street, Inglewood, Cal., fined.

John Bradley, 120 Julien Avenue, San Francisco, Cal., who was reported by the radio inspector at San Francisco for violation of sections 5 and 7 of the act of August 13, 1912, for the use of fraudulent call signals and interfering with the commercial traffic being handled by the Hillcrest station of the Marconi company and the steamship *J. A. Chanslor*, has been reprimanded by the Secretary of Commerce, and his licenses have been suspended.

LOS ANGELES AMATEURS REPORTED FOR VIOLATIONS.

In addition to the list of names given in Bulletin No. 12, the following amateurs were found to be operating stations without proper licenses, in violation of the radio act, and the cases have been referred to the United States district attorney for prosecution:

George Hawley, 1257 Cypress Avenue, Los Angeles, Cal.

Jack Hyams, 1194 Spring Street, Los Angeles, Cal.

Edmund Whiting, 1047 Mignonette Street, Los Angeles, Cal.

The maximum penalty for the above violation is \$500 fine and confiscation of the radio apparatus unlawfully used.

RADIO-SERVICE PERSONNEL.

Charles C. Kolster, assistant radio inspector at New York, N. Y., has been promoted to the position of radio inspector at New Orleans, La., to succeed Arthur R. Rice, who resigned on December 9, 1915. Harry Sadenwater, assistant radio inspector at New York, succeeds Mr. Kolster.

Charles Blankenship, assistant radio inspector at Chicago, Ill., has been transferred to the office of the chief radio inspector, New York, N. Y.

COMMERCIAL EXTRA FIRST-GRADE LICENSES.

The Department issues a special license, known as commercial extra first-grade, to radio operators whose trustworthiness and efficient service entitle them to confidence and recognition. These licenses are given consideration by the Civil Service Commission in examinations for positions requiring knowledge of radiotelegraphy, when experience is rated as a part of such examinations. Applicants for this grade of license must pass a special examination. To be eligible for this examination they must hold commercial first-grade licenses, and their certificates of skill in radio communication, issued under the act of June 24, 1910, or licenses under the act of August 13, 1912, must record 18 months' satisfactory commercial service at sea or at land stations, either or both, during the two years previous to the filing of the application for examination, as shown by indorse-

ment on the license service records, or other satisfactory evidence, and provided that the applicants have not been penalized for a violation of the radio laws and regulations. A speed of at least 30 words per minute, Continental Morse, and 25 words per minute, American Morse (five letters to the word), must be attained. The technical questions and the questions on the radio laws and regulations are considerably wider in scope than those for commercial first grade, and a higher percentage is required.

All examination papers, including the code test sheets, are marked and forwarded to the commissioner of navigation, with a recommendation by the radio inspector or examining officer. Examination papers are marked upon the basis of 100, and licenses are recommended only if 80 or better is attained.

During the past 18 months the Secretary of Commerce has issued commercial extra first-grade licenses to operators in the following order:

E. N. Pickerill, New York, N. Y.
H. Sadenwater, New York, N. Y.
R. R. Carlisle, San Francisco, Cal.
D. I. Moir, Seattle, Wash.
H. B. Herty, New Orleans, La.
E. M. Cadwell, New York, N. Y.
S. E. Miller, San Francisco, Cal.
C. A. Scott, Boston, Mass.
J. A. Worrall, New York, N. Y.
E. K. Oxner, Boston, Mass.
J. W. Swanson, New York, N. Y.
A. E. Gerhard, San Francisco, Cal.

G. A. Geare, Washington, D. C.
H. W. Sinclair, San Francisco, Cal.
J. H. Benson, Philadelphia, Pa.
E. W. Lovejoy, San Francisco, Cal.
Leo F. Whitehead, Boston, Mass.
W. J. Lynch, Brooklyn, N. Y.
F. E. Nickel, San Francisco, Cal.
J. W. Lee, Philadelphia, Pa.
R. B. Black, San Francisco, Cal.
Irving Ellingham, New York, N. Y.
James Maratta, Philadelphia, Pa.
Frank Orth, New York, N. Y.

PRICES OF BERNE PUBLICATIONS.

1. Official Nomenclature of Radiotelegraph Stations:
 - (a) Fourth edition, August, 1915 (English, French, or German), 3.60 francs per copy, postage not included; 4.90 francs per copy, postpaid.
 - (b) Supplements to the above list, issued monthly, 5 francs postpaid, for all supplements up to the end of the calendar year 1916.
2. Liste Alphabetique des Indicateurs d'Appel (alphabetical list of call letters):
 - (a) Third edition, July, 1913, 1.30 francs per copy, postage not included; 1.80 francs per copy, postpaid.
 - (b) Supplements to the above list to July 1, 1916, including back numbers, 4 francs, postpaid.
3. Conference of Berlin, 1906; 1 volume, 374 pages, 5 francs, postage not included.
4. Conference of London, 1912; 1 volume, 650 pages, 8 francs, postage not included.
5. International Radiotelegraphic Convention of London, with its Final Protocole and Service Regulations Attached; booklet of 35 pages, 40 centimes per copy, postage not included; 55 centimes, postpaid.
6. Extract of Service Attached to the London Convention; 5 centimes per copy, postage not included.

7. Time Signals and Meteorological Radiograms, Transmitted by the Eiffel Tower; 10 centimes per copy, postage not included; 15 centimes per copy, postpaid.

8. General Statistics of Radiotelegraphy; groups of publications relating to the situation on June 30, 1908, and during the years 1910 to 1913, inclusive, 35 centimes per fascicule, postpaid.

The above publications may be procured at the prices stated from the Director of the International Bureau of the Telegraph Union, Radiotelegraphic Service, Berne, Switzerland. Remittances should be made by means of international postal money orders.

ADDITIONAL COPIES

OF THIS PUBLICATION MAY BE PROCURED FROM
THE SUPERINTENDENT OF DOCUMENTS
GOVERNMENT PRINTING OFFICE
WASHINGTON, D. C.

AT
5 CENTS PER COPY
SUBSCRIPTION PRICE, 25 CENTS PER YEAR



RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, February, 1916—No. 14

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Washington, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

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The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the List of Radio Stations of the United States.

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Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
E. F. SWEET,
Acting Secretary.

NEW STATIONS.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations, published by the Berne bureau.]

Vessel.	Call signal.	System.	Wave lengths.	Owner of vessel.
Amazonia ¹	KOO	Marconi.....	300, 600	R. Lawrence Smith (Inc.).
Arctic ²	WLH	.....	300, 500, 600	Union Lumber Co.
Catania.....	WTI	Marconi.....	300, 600	Huasteca Petroleum Co.
Charles Pratt.....	KSQ	do.....	300, 600	Standard Oil Co. of New Jersey.
Dade.....	KXU	do.....	300, 600	Miami Steamship Co.
Diana.....	KZM	do.....	300, 600	C. Ledyard Blair.
Floridian ³	WLR	{ Kilbourne & Clark, 240.	300, 450, 525, 600	American-Hawaiian Steamship Co.
Healdton.....	KOF	Marconi.....	300, 600	Standard Oil Co. of New Jersey.
Henry Williams.....	KRL	do.....	300, 600	Vacuum Oil Co.
Jacob Jones.....	NKG	.....	300, 600	United States Naval Radio Service, Radio, Va.
Munwood.....	KUH	Marconi.....	300, 600	Munson Steamship Co.
New York (KUW).....	KUW	do.....	300, 600	Texas Co.
Santa Barbara ^{1, 4}	WBJ	do.....	300, 600	Atlantic & Pacific Steamship Co.
Texas (KUM).....	KUM	do.....	300, 600	Texas Co.

¹ Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co.

² Station operated and controlled by Higgins Steamship Co.

³ Range, 100; service, PG, hours X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram transoceanic service, 8 c. per word 80 c. minimum per radiogram. Station operated and controlled by the American-Hawaiian Steamship Co., owner of vessel.

⁴ Service, PG.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, only.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Columbia, Mo.....	9XQ	425, 800	P	X	University of Missouri.
Fall River, Mass.....	1ZF	200, 425, 600	P	X	Harold C. Bowen.
Lincoln, Nebr.....	9XT	300, 450	P	X	Thomas C. Rice.
Little Rock, Ark.....	5XO	1 625	P	X	Ed Cornish.
San Antonio, Tex. (5ZF).....	5ZF	300, 450, 600	P	(*)	Sidney Friederich.
San Antonio, Tex. (5ZR).....	5ZR	200, 300, 450	P	(*)	John C. Rodriguez.
Seattle, Wash. (7XZ).....	7XZ	1 600, 680	P	X	University of Washington.
Worcester, Mass.....	1YK	(1)	P	X	Worcester Polytechnic Institute.

¹ Variable.

² 8 p. m. to 11.30 p. m.

³ 8.15 p. m. to 11.30 p. m.

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
1YK	First district:	7XZ	Seventh district: Seattle, Wash.
1ZF	Worcester, Mass.	9XQ	Ninth district:
	Fall River, Mass.	9XT	Columbia, Mo.
5XO	Fifth district:		Lincoln, Nebr.
5ZF	Little Rock, Ark.		
5ZR	San Antonio, Tex. (5ZF).		
	San Antonio, Tex. (5ZR).		

SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Call signal.	Name.	Call signal.	Name.
KOF	Healdton.	KXU	Dade.
KOO	Amazonia.	KZM	Diana.
KRL	Henry Williams.	NKG	Jacob Jones.
KSQ	Charles Pratt.	WBJ	Santa Barbara.
KUH	Munwood.	WLH	Arctic.
KUM	Texas.	WLR	Floridian.
KUW	New York.	WTI	Catania.

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

- Name =Name of station.
 G. loc. =Geographical location: O=west longitude, N=north latitude.
 Call =Call letters assigned.
 System=Radio system used and sparks per second.
 Range =Normal range in nautical miles.
 W. L. =Wave lengths assigned: Normal wave lengths in *italics*.
 Service=Nature of service maintained:
 PG=General public.
 PR=Limited public.
 P=Private.
 O=Government business exclusively.
 Hours =Hours of operation:
 N=Continuous service.
 X=No regular hours.
 m=a. m. (12m=midday).
 s=p. m. (12s=midnight).
 Rates =Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)
 Notes =Refer to notes in the Berne list.

OTHER ABBREVIATIONS.

Marconi Co.=Marconi Wireless Telegraph Co. of America.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne Bureau.]

- ANDERSON.—Notes, Radio station operated and controlled by Coast Artillery Corps, United States Army, Washington, D. C. Training school station, Coast Artillery School, located at Fort Monroe, Va.
 BENTON HARBOR, MICH.—Range, 60; system, Marconi, 120.
 BUCKROE.—Notes, Radio station operated and controlled by Coast Artillery Corps, United States Army, Washington, D. C. Training school station, Coast Artillery School, located at Fort Monroe, Va.
 ENSENADA, P. R.—Hours, week days, 8m-12m, 2s-5s; Sundays, 9m-12m.
 JACKSONVILLE, FLA.—Hours, 6m-8m, 10m-1s, 4s-7s.
 KVICHAK, ALASKA (KML).—Name Alockanok River, Alaska. Note, Station limited to correspondence with ship and shore stations of the North Alaska Salmon Co.
 KVICHAK, ALASKA (KMT).—Name, Hales Creek, Alaska; service, P. Note, Station limited to correspondence with ship and shore stations of the North Alaska Salmon Co.
 SEATTLE, WASH. (KPE).—Range, 200; system, Kilbourne & Clark, 240. Notes, Rate, PG, 6 c. per word 60 c. minimum per radiogram.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne Bureau.]

ASTRAL.—Change name to Standard II.

BREAKWATER.—System, Marconi, 120; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, North Pacific Steamship Co., owner of vessel.

CAMINO.—Note, Barber & Co., owner of vessel.

CITY OF COLUMBUS.—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

COAMO.—Note, W. L., 300, 450, 600.

COLON (WHO).—Strike out all particulars.

COLUMBIA (KYM).—Strike out all particulars.

COMAL.—System, Marconi, 1,000; W. L., 300, 450, 600; Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram transoceanic service, 8 c. per word 80 c. minimum per radiogram.

EURANA.—(Incorrectly spelled "Eruana," in list of ship stations, alphabetically by names of vessels, in Bulletin No. 13.) Notes, Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co.

FINLAND.—System, Marconi, 480. Note, Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

GARGOYLE.—Range, 300; system, Marconi, 1,000; service, PG, hours, X. Notes, Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co.

MOHAWK (KVM).—System, Marconi, 1,000; W. L., 300, 450, 600. Note, Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

MUNAMAR.—Range 200; system, Marconi, 480; service, PG; hours, N; Munson Steamship Co., owner of vessel. Notes, Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co.

NEW YORK (KNK).—Strike out all particulars.

OCEANA.—Strike out all particulars.

OWERA.—Strike out all particulars.

PARAGUAY.—System, Marconi, 400; hours, X. Note, Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

PHILADELPHIA (KSM).—System, Marconi, 240. Note, Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

PILOT BOY.—Strike out all particulars.

PONCE.—System, Marconi, 1,000; W. L., 300, 450, 600. Note, Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

ROANOKE.—System, Marconi, 400.

ROSE CITY.—System, Marconi, 400.

ST. PAUL (KSO).—System, Marconi, 480. Note, Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

SANDY HOOK.—Strike out all particulars.

SAN RAMON.—Note, Parr-McCormick Steamship Line, owner of vessel.

SANTA CLARA (WRS).—Strike out all particulars.

SUWANNEE.—Note, Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

TAMESI.—Notes, Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co.

TATOOSH.—Note, Anacortes Fisheries Co.

TEXAS (KUR).—Change name to Georgia.

VIGILANCIA.—Note, Roger L. Farnum, owner of vessel.

WAPAMA.—Note, Wapama Steamship Co., owner of vessel.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KML, *read* Alockanok River, Alaska c; KMT, *read* Hales Creek, Alaska c; KSA, *read* Standard II b; KUR, *read* Georgia b; strike out all particulars following the call signals KNJ, KNK, KNV, KPL, KYM, KZG, WHO, and WRS.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, only.]

ILLIOPOLIS, ILL.—Strike out all particulars.

NEW BEDFORD, MASS.—Strike out all particulars.

SPRINGFIELD, ILL.—W. L., 600, 1800.

SPECIAL LAND STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out 1ZO and 9ZK.

MISCELLANEOUS.

PORTUGUESE GOVERNMENT ERECTS RADIO STATION.

Information has just been received from Vice Consul Ramon I. Janer, at Lisbon, to the effect that the Portuguese Government has recently constructed a building near Leixoes (Oporto) for the purpose of installing a radio station, and that the apparatus is to be installed shortly.

THE SAFETY-FIRST EXHIBIT.

The several departments of the Government are arranging a "safety-first" exhibit, to be held in the New National Museum Building, Washington, D. C., during the week beginning February 21, 1916. In connection with the exhibit the Bureau of Navigation Radio Service will display a complete radio set and the various instruments used by radio inspectors in connection with the enforcement of the radio laws. The public is invited to attend this exhibit.

SAGAPONACK STATION CLOSED.

The Sagaponack station of the Marconi company, located at Long Island, N. Y., has been temporarily closed. However, the name of this station should not be stricken from the list unless information to that effect appears in a subsequent bulletin.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, March, 1916—No. 15

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Washington, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the List of Radio Stations of the United States.

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E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:

E. F. SWEET,
Acting Secretary.

NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Longitude and latitude (approximate).	Call signal.	Range.	System.	Wave lengths.
Metha Nelson (schooner) ¹	O 158 28 00 N 55 45 00	KMP	20	Composite, 100..	300, 500, 600
Navassa Island ²	O 74 52 00 N 18 30 00	WQN	.....	.....	.....

¹ Service, limited, commercial; hours, X. Radio station operated and controlled by Alaska Packers' Association. The vessel is moored in Bristol Bay, Alaska, and communicates with stations as Nushagak (KMG) and Clark's Point, Alaska.

² Radio station operated and controlled by Snare & Triest Co.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Vessel.	Call signal.	System.	Wave lengths.	Owner of vessel.
Arborean.....	WLS	Marconi.....	300, 600	American-Hawaiian Steamship Co.
Artisan.....	WKW	.....do.....	300, 600	Do.
H. H. Rogers.....	KSI	.....do.....	300, 600	Standard Oil Co. of New Jersey.
Joseph Pulitzer ¹	WPZ	Kilbourne & Clark, 240.	300, 450, 525, 600	Port of Portland.
Pearl Shell.....	WIC	Marconi.....	300, 600	Pearl Shell Steamship Co.
Ravalli ²	WGI	.....do.....	300, 600	Pacific Coast Steamship Co.
Yaguez ³	KDY	Marconi, 1,000.....	300, 450, 600	Vacuum Oil Co.

¹ Range, 75; service, PG; hours, X; rates, 4 c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by Port of Portland, owner of vessel.

² Range, 100; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.

³ Range, 200; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KDY	Yaguez..... b	WKW	Artisan..... b
KMP	Metha Nelson (schooner)..... c	WLS	Arborean..... b
KSI	H. H. Rogers..... b	WPZ	Joseph Pulitzer..... b
WGI	Ravalli..... b	WQN	Navassa Island..... c
WIC	Pearl Shell..... b		

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, only.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Dallas, Tex.....	5ZC	200, 300, <i>485</i> ...	P	X	Frank M. Corlett.
Kansas City, Mo. (9YU).....	9YU	200, <i>300</i>	P	X	Field Company A, Signal Corps, National Guard of Missouri.
La Grande, Oreg.....	7ZH	<i>200, 300, 425</i> ...	P	X	Orland M. Heacock.
Leonia, N. J.....	2ZE	<i>200, 325</i>	P	X	Paul F. Godley.
Minneapolis, Minn. (9ZM)...	9ZM	200, <i>425</i>	P	X	Marc Frazer.
Montclair, N. J.....	2ZI	<i>200, 325</i>	P	X	Adams-Morgan Co.
New Bedford, Mass.....	1ZN	200, <i>300, 425, 600</i>	P	(1)	Milton A. Baylies.
Pullman, Wash.....	7YI	500, <i>1,750</i>	P	X	State College of Washington.
State College, Pa.....	8XE	Variable.....	P	(2)	Pennsylvania State College.
Waco, Tex.....	5YG	200, <i>300, 600, 1,625.</i>	P	X	E. T. Genheimer.

¹ Hours, continuous during day and from 6s to 9s.² Hours, 7s to 10.30s.

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
1ZN	First district: New Bedford, Mass.		
2ZI	Second district:	7YI	Seventh district:
2ZE	Montclair, N. J.	7ZH	Pullman, Wash.
	Leonia, N. J.	8XE	La Grande, Oreg.
5YG	Fifth district:		Eighth district: Pennsylvania State College.
5ZC	Waco, Tex.	9YU	Ninth district:
	Dallas, Tex.	9ZM	Kansas City, Mo. (9YU).
			Minneapolis, Minn. (9ZM).

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name =Name of station.

G. loc.=Geographical location: O=west longitude, N=north latitude.

Call =Call letters assigned.

System=Radio system used and sparks per second.

Range =Normal range in nautical miles.

W. L. =Wave lengths assigned: Normal wave lengths in italics.

Service=Nature of service maintained:

PG=General public.

PR=Limited public.

P=Private.

O=Government business exclusively.

Hours =Hours of operation:

N=Continuous service.

X=No regular hours.

m=a. m. (12m=midday).

s=p. m. (12s=midnight).

Rates =Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

Notes =Refer to notes in the Berne list.

OTHER ABBREVIATIONS.

Marconi Co.=Marconi Wireless Telegraph Co. of America.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

- AKUTAN, ALASKA.**—G. loc., 0 165° 48' 00", N 54° 08' 00"; range, 25; W. L., 300, 500, 600; hours, X.
- GALVESTON, TEX.**—Service, PG and special; rates, PG, 6 c. per word, 60 c. minimum per radiogram; special, 6 c. per word, 60 c. minimum per radiogram (for correspondence with Heald Bank Lightship); for vessels reported by the lightship \$1 for each report. Note, Press dispatches and special service with Heald Bank Lightship conducted on the 500-meter wave length.
- HOBOKEN, N. J.**—W. L., 2,240; service, limited commercial.
- JUALIN, ALASKA.**—G. loc. (approximate), 0 135° 00' 00", N 58° 56' 00"; range, 100; system, Marconi, 120; W. L., 300, 450, 600, 1,600; service, limited commercial; hours, X. Note, Radio station operated and controlled by Jualin Mines Co.
- JUNEAU, ALASKA.**—G. loc. (approximate), 0 134° 25' 00", N 58° 19' 00".
- PREMIER** (moored schooner).—Strike out all particulars.
- SOUTH WELFLEET, MASS.**—System, Marconi, 233 and 240; hours, X.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

- ADVANCE.**—W. L., 300, 450, 600.
- APACHE (KVA).**—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- ARGYLL (WTB).**—Range, 150; system, Federal Poulsen Arc, 250; W. L., 300, 600, 1,800; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Federal Telegraph Co.
- BRABANT.**—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service 8 c. per word 80 c. minimum per radiogram.
- CATANIA.**—Range, 150; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- CHINA.**—Range, 150; system, Marconi, 1,000; W. L., 300, 450, 600. Note, China Mail Steamship Co., owner of vessel.
- CITY OF EVERETT.**—Note, Radio station operated and controlled by Atlantic Communication Co.
- DELAWARE SUN.**—System, Marconi, 400; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- EDNA.**—Strike out all particulars.
- EL ALBA.**—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- EL NORTE.**—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- EURANA.**—Range, 200; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- FLORIDIAN.**—Range, 300; system, Marconi, 1,000; W. L., strike out 525; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- GARGOYLE.**—W. L., 300, 450, 600.
- GEORGIA (KUR).**—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

- GLENPOOL.—W. L., 300, 450, 600; hours, X.
 GOLD SHELL.—Range, 250; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X.
 HARVARD.—System, Federal Poulsen Arc, 360; W. L., 300, 600, 1,800; rates, 4 c. per word 40 c. minimum per radiogram.
 KLAMATH.—System, Marconi, 400.
 LYMAN STEWART.—Range, 150; system, Federal Poulsen Arc, 250; W. L., 300, 600, 1,800.
 MONTEREY (KWY).—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
 NEWPORT (WWH).—Range, 150; system, Marconi, 480.
 NUECES.—Hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram; transoceanic service, 8 c. per word 80 c. minimum per radiogram.
 OLEUM.—Range, 150; system, Federal Poulsen Arc; W. L., 300, 600, 1,800; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Federal Telegraph Co.
 PONCE.—Hours, X.
 SAN PABLO.—Strike out all particulars.
 SAN PEDRO.—Strike out all particulars.
 SANTA BARBARA.—Range, 200; system, Marconi, 1,000; W. L., 300, 450, 600; hours, X.
 SANTA CRUZ.—Strike out all particulars.
 SANTA MARIA (WTF).—Range, 150; system, Federal Poulsen Arc, 250; W. L., 300, 600, 1,800; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Federal Telegraph Co.
 SATSUMA.—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
 SIERRA.—Range, 150; system, Federal Poulsen Arc, 360; W. L., 300, 600, 1,800; rates, 8 c. per word, 80 c. minimum per radiogram.
 SONOMA (WHM).—System, Federal Poulsen Arc, 360; W. L., 300, 600, 1,800. Note, Radio station operated and controlled by Federal Telegraph Co.
 STANLEY DOLLAR.—Strike out all particulars.
 SULTANA.—Strike out all particulars.
 TEXAS (KUM).—Range, 300; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
 TOLEDO.—System, Marconi, 400; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
 VENTURA.—Range, 150; system, Federal Poulsen Arc, 360; W. L., 300, 600, 1,800; rates, 8 c. per word, 80 c. minimum per radiogram. Note, Radio station operated and controlled by Federal Telegraph Co.
 WILHELMINA.—System, Marconi, 1,000; W. L., 300, 450, 600.
 YALE.—System, Federal Poulsen Arc, 360; W. L., 300, 600, 1,800; rates, 4 c. per word, 40 c. minimum per radiogram.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out all particulars following the call signals KLW, KLX, KMP, KZH, WPA, WSD, and WSP.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, only.]

- AGRICULTURAL COLLEGE, N. D.—W. L., 300, 500, variable.
 CANAL DOVER, O.—W. L., 200, 450.
 CINCINNATI, O (8ZF).—W. L., 200, 425.
 GRAND FORKS, N. D.—W. L., 1,500, variable.
 HAMILTON, O.—W. L., 200, 300, 425.
 LOS ANGELES, CAL. (6XL).—W. L., 600, variable.

NORTHAMPTON, MASS.—W. L., 200, 300, 425, 600. Note, Radio station operated and controlled by Dean A. Lewis and G. C. Sabin.
 ST. LOUIS, MO. (9XC).—W. L., 700, 825; service, P; hours, X.
 SAN FRANCISCO, CAL. (6XD).—Strike out all particulars.
 SLINGERLANDS, N. Y.—W. L., 300, 400, 550, 600, 1,000.
 SPRINGFIELD, O.—W. L., 200, 300, 450.
 WHEELING, W. VA.—W. L., 200, 450.

SPECIAL LAND STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out 6XD (San Francisco, Cal.).

MISCELLANEOUS.

CHANGES IN PERSONNEL.

R. B. Woolverton, radio inspector at San Francisco, Cal., has resigned, effective March 1, 1916, and V. Ford Greaves, radio engineer, will take charge of the San Francisco district temporarily.

CUTTYHUNK ISLAND RADIO STATION ALLOWED TO OPERATE.

The United States Coast Guard has entered into an agreement with Chester Veeder granting him permission to operate his radio station at Cuttyhunk Island under the supervision of the Coast Guard. Mr. Veeder will be allowed the privilege of communicating with amateur stations for practice, or for other purposes, using his amateur call letters, provided the same is not commercial business, and provided the wave length used is 200 meters or lower and does not interfere with commercial or Government radio stations. The superintendent of the Naval Radio Service has assigned the call letters "NSA" to this station when it is operating as a Government station.

RADIO COMMUNICATION CHARTS TO BE ISSUED GRATIS.

The superintendent of the Naval Radio Service announces that, commencing with March, a complete communication chart will be issued to the public gratis upon request. This chart includes the various merchant vessels in North and South American trade, the time and date they may be reached by radio, the coastal stations through which the traffic should be routed, and rates for radio land-line service.

KEY WEST NAVAL RADIO STATION OPEN TO COMMERCIAL TRAFFIC.

The Naval Radio Service has requested the Bureau to issue instructions to operators on all ships to the effect that the Key West station is open to commercial traffic and handles ships' position reports, which are forwarded to the New York Herald not later than 8 p. m. daily.

SPANISH INVENTION OF IMPROVED RADIOGRAM RECEIVER.

El Imparcial, one of the leading dailies of Madrid, states, under date of January 24, 1916, that the Minister of Public Works, after examination and report by the Centro Tecnico de Aeronauticos (a bureau

of the ministry), has approved a radiogram receiver of a type that does away with earpieces. It is said that the radius of the new apparatus is in excess of 5,000 kilometers (the kilometer being the equivalent of about $\frac{5}{8}$ mile), and that it is contemplated to institute radiographic service between Spain and the United States.

ACCESSIONS TO LONDON RADIOTELEGRAPHIC CONVENTION.

The following countries have, since June 28, 1915, acceded to the International Radiotelegraphic Convention signed at London on July 5, 1912: Bolivia, October 13, 1915; Peru, July 12, 1915.

AMENDMENTS.

The Radio Laws and Regulations of the United States, edition of July 27, 1914, are hereby amended as follows:

Page 56, parenthetical clause, lines two and three, paragraph 63, should read:

SEC. 4, fifteenth regulation, act of August 13, 1912.

WIRELESS AS A SAFEGUARD TO LIFE AT SEA.

[The marine disasters described below are in addition to those listed in a publication of the Bureau of Navigation, Radio Service, entitled "Important Events in Radiotelegraphy," dated Feb. 1, 1916.]

1909.

June 10.—Steamship *Slavonia* stranded off Azores. Marconi operator, Stanley Coles, summoned aid by wireless and 410 lives were saved.

1910.

September 9.—Pere Marquette Car Ferry No. 18 sank in middle of Lake Michigan. The SOS call was heard by Ludington wireless station and steamer *Pere Marquette No. 17*. Latter rescued four passengers and two of crew. All others lost their lives, including wireless operator, S. S. Sczpanck.

1911.

November 22.—Steamship *Prinz Joachim* struck rocks at Atwood Bay, Samana Islands. Wireless communication, established direct with New York City, resulted in the saving of all on board.

1912.

February 22.—Steamship *Madison* rammed by steamship *Hipplavit Dumois*. Wireless was the means of saving the entire crew and all the passengers.

April.—Steamship *Denver* in collision with steamship *El Sud* off Galveston Bar. *El Sud* not equipped with wireless, but assistance was sent to *El Sud* in response to *Denver's* calls, and the wrecked vessel was towed into Galveston.

August 16.—Steamship *Pleiades* ran ashore in Magdalena Bay. Operator G. Bennett summoned aid by wireless and all were saved.

December 5.—Steamship *Easton*, of the United States & Dominion Transportation Co., struck on Iroquois Reef, Lake Superior. Wire-

less calls were answered by stations at Port Arthur, Ontario, and Duluth, Minn. Tugs were sent to assistance of stranded steamer in answer to wireless calls and the *Easton* was released with slight damage.

1913.

April.—The *Robert Dollar* while crossing the Columbia River bar struck heavily but could not locate any damage and proceeded on her voyage to Japan. When 100 miles offshore her stern post and rudder broke off close up to her counter and dropped into the ocean, leaving her helpless in a rough sea and a high wind. Communication with shore was established by radio and a tug was sent to assistance of the helpless steamer.

June 13.—Steamship *Yukon* struck reef off Alaskan coast and sank. The radio operators summoned aid by wireless and all were saved.

June 19.—Steamship *Riverside* wrecked and sank off California coast. Wireless was instrumental in saving the lives of all on board.

1914.

August 17.—Steamship *Prince Albert* ran ashore on Butterworth Rocks during dense fog. Assistance was summoned by wireless and all passengers and crew were saved.

August 25.—Steamship *Admiral Sampson* sank after collision with the steamship *Princess Victoria* off Point No Point, near Seattle, Wash. Eight lives were lost. SOS sent out by *Princess Victoria* was picked up by a radio station in Seattle and also by the steamship *Admiral Watson*. A tug was sent from Seattle to the assistance of the *Admiral Sampson*.

September 1.—Steamship *City of Chicago* was reported on fire 12 miles out from Chicago. Wireless was utilized and the ship returned safely to port.

September 18.—Steamship *Francis H. Leggett* sank 60 miles south of Columbia River. The radio station at Astoria, Oreg., intercepted a message to that effect which had evidently been sent from a foreign cruiser to a Canadian station. The Astoria station notified all ships in the vicinity to look for survivors. Two persons were rescued.

October 11.—The steamship *Almirante*, of the United Fruit Co., stranded at Cartagena Harbor; 66 passengers and 90 persons in crew. No lives lost.

October 15.—Steamship *Metapan* rammed and sunk by *Iowan* at the entrance of Ambrose Channel, New York. SOS was answered by vessels in various parts of the harbor.

November 10.—Steamship *Lakeland* ran ashore 8 miles from Alpena. Radio operator sent out distress signals which were answered by shore stations at Cleveland, Buffalo, and Tobermory. The tug *Favorite* was informed and went to *Lakeland's* assistance. Constant communication was maintained between the tug and the distressed vessel.

November 23.—Steamship *Hanalei* struck on reef near Bolinas, Cal. SOS answered by radio station at San Francisco, revenue cutter *McCulloch*, oil tankers *El Segundo* and *Richmond*. Heavy seas and reefs prevented their going to assistance of the distressed vessel which was slowly being pounded to pieces. The wireless cabin was washed away, but Operator Lovejoy established communication with

shore by means of pocket flashlight and directed work of rescue. Forty-three persons were saved.

December 30.—Steamship *Colorado* became disabled off Little Egg Harbor, N. J.; crew of 35; no loss of life. In answer to wireless calls, tugs brought vessel into New York.

1915.

January 10.—Steamship *Mexicano*, Pierce Navigation Co., ran ashore on Tampico, Mexico, Breakwater. The radio operator sent out wireless distress calls, which were answered by Mexican Government station at Tampico. The vessel was floated by tugs.

January 26.—Steamship *Washingtonian* sank after collision with schooner *Elizabeth Palmer* off Delaware Breakwater. All the crew arrived in the ship's boats on the Fenwick Island lightship, from which vessel wireless messages were sent to the steamship *Hamilton*, which stopped and took the wreck victims to New York.

February 4.—Steamship *Colon* stranded off bar at Topolobampa. SOS call answered by U. S. S. *Maryland*, *Korrigan III*, and the U. S. S. *Annapolis*. Passengers and crew were transferred to the *Maryland* and the *Annapolis*.

February 4.—The oil tanker *Chester*, though not equipped with wireless, attracted the attention of the American liner *Philadelphia* by sending the SOS on Morse lights. The radio operator of the *Philadelphia* established communication by this means and 33 men were rescued from the sinking ship.

March 25.—The steamship *Parisian* grounded in Mississippi River. While in this position she was struck, on March 27, by the steamship *Heredia*, of the United Fruit Co. Wireless brought prompt aid to the two distressed vessels.

March 27.—The steamship *Heredia* struck the steamship *Parisian*. (See above.) The *Heredia* had 164 passengers aboard.

April 1.—Steamship *Mexico*, Pacific Steam Navigation Co., ran aground near Southwest Pass, La. Wireless was instrumental in bringing tugs to float vessel.

April 14.—The steamship *Seminole* wrecked off Yuma Bay. Wireless was utilized, but passengers reached shore safely before rescuing vessels arrived.

April 21.—Steamship *San Zeferno* grounded in Galveston Harbor; crew of 40 aboard. Wireless was used to report, but vessel was found to be in no danger.

May 7.—The steamship *Asuncion* ran ashore off Fraser River. Wireless was utilized in summoning tugs to her assistance.

June 16.—Steamship *Alabama* was struck by steamship *Delaware* 53 miles south of Scotland lightship in dense fog. Neither vessel, however, was badly damaged. Wireless was used to notify owners.

July 2.—Steamship *Panuco* grounded at entrance to South Pass, La.; crew of 35 aboard. Wireless used to bring prompt aid to float vessel.

August 23.—Steamship *Metapan* grounded in Cartagena Harbor. There were 45 passengers and 19 in crew. The cargo was promptly discharged into lighters and steamer subsequently floated.

September 13.—Steamship *Sant Anna*, of the Fabre Line, was on fire in midocean, latitude 40° 23' north, longitude 47° 30' west. The SOS call brought the *Ancona*, which took off 600 persons and

conveyed the distressed vessel to port. The *Sant Anna* carried 1,700 persons in addition to the crew.

November 9.—Steamship *Lievatta* (Italian), loaded with cased kerosene and gasoline, caught fire 65 miles east of Sabine Bar, Tex. Reported by wireless by steamship *Gulfstream*, which vessel stood by the burning steamer until other assistance, summoned by wireless, arrived from Port Arthur and Galveston. Without the assistance thus secured the vessel and cargo would have been a total loss.

December 1.—Steamship *Flamenco* ran aground at South Pass, La. The accident was reported by wireless and rescue soon followed.

December 13.—Steamship *Antilla* collided with a barge beached off Sea Gate. Wireless was instrumental in saving the cargo.

1916.

January 17.—Car ferry *Pere Marquette No. 19* ran aground 4 miles north of Ludington, Mich., at 7.30 p. m. Wireless communication was established with Ludington and *Pere Marquette* car ferries *No. 17* and *No. 18*, which were advised not to come in close on account of shoal water. Wireless communication was maintained throughout salvage operations.

January 22.—Steamship *Centralia*, when off Columbia River, broke her rudder and the heavy seas washed away deck load and flooded the engine and wireless rooms. The aerial was carried away, but repaired by the operator, Earl Diamond, who then called SOS. The call was immediately answered by steamships *Governor*, *Adeline Smith*, *Yosemite*, *Admiral Schley*, *Eurana*, and land stations at Marshfield and Eureka. Weather and sea finally moderated and the ship made San Francisco without assistance.

February 1.—Steamship *Tapata Maru* was in collision with the steamship *Silver Shell*. SOS was answered by radio stations at Boston and Cape Race and various steamers. The crew was rescued by the *Silver Shell*.

February 7.—Steamship *Caloria*, of the Standard Oil Transportation Co., ran aground at the head of South Pass, La. A number of tugs and lighters responded to the SOS call and the 31 persons on board the wrecked vessel were rescued.

February 25.—The steamship *Cretan*, of the Merchant & Miners' Line, collided with an unknown vessel off Diamond Shoals, and was thereby rendered a helpless wreck. The 27 passengers aboard were safely transferred to the tramp steamer *Dorothy* which was towed into port by the Coast Guard cutter *Onondaga*, the vessel responding to the *Cretan's* wireless call for help.

February 26.—The French auxiliary cruiser *Provence II* (so designated to distinguish her from French battleship *Provence*) was torpedoed and sunk in the Mediterranean Sea. French and British patrol boats, which were summoned by wireless, rescued 870 persons.

ADDITIONAL COPIES

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UNIVERSITY

RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, April, 1916—No. 16

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WASHINGTON, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the List of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
E. F. SWEET,
Acting Secretary.

NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	System.	Station controlled by—
Inglewood, Cal.....	KFZ	Federal Poulsen Arc.	Federal Telegraph Co.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Vessel.	Call signal.	System.	Wave lengths.	Owner of vessel.
Admiral Watson ¹	WAW	Kilbourne & Clark, 240.	300,450 325,600	Pacific-Alaska Navigation Co.
Barge No. 1.....	WQA	Marconi.....	.....	Inland Navigation Co.
Buccaneer ²	KFO	do.....	300,600	Freeport & Tampico Fuel Oil Transportation Co.
Curacao.....	WGK	.....	300,600	Pacific Coast Co.
Ecuador.....	WBN	.....	.....	Pacific Mail Steamship Co.
Fred'k Luckenbach.....	KGW	Marconi.....	300,600	Edgar F. Luckenbach.
La Brea ³	WON	Federal Poulsen Arc.	300,600	Union Oil Co.
Lakeport.....	WDJ	Marconi.....	300,600	Port Huron & Duluth Steamship Co.
Lakewood.....	WDK	do.....	300,600	Do.
Suruga.....	WGD	do.....	300,600	Barber & Co. (Inc.).
Tormentor ²	KFN	do.....	300,600	Freeport & Tampico Fuel Oil Transportation Co.
Venezuela.....	WBG	.....	.....	Pacific Mail Steamship Co.

¹ Range, 150; service, PG; hours, N; rates, 4 c. per word, 40 c. minimum per radiogram. Note, Radio station operated and controlled by Pacific-Alaska Navigation Co., owner of vessel.

² Note, Radio station operated and controlled by Marconi Co.

³ Range, 150; service, PG; hours, X; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram, transoceanic service, 8 c. per word, 80 c. minimum per radiogram. Note, Radio station operated and controlled by Federal Telegraph Co.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship stations; c=land station.]

Call Signal.	Name.	Call signal.	Name.
KFN	Tormentor.....	WDJ	Lakeport.....
KFO	Buccaneer.....	WDK	Lakewood.....
KFZ	Inglewood, Cal.....	WGD	Suruga.....
KGW	Fred'k Luckenbach.....	WGK	Curacao.....
WAW	Admiral Watson.....	WON	La Brea.....
WBG	Venezuela.....	WQA	Barge No. 1.....
WBN	Ecuador.....		

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, only.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Columbia, Mo. (9YS).....	9YS	300,375	P	X	University of Missouri.
Fayetteville, Ark.....	9YM	300,400	P	X	University of Arkansas.
Richmond Hill, N. Y.....	22V	300,3500	P	X	Alfred H. Grabe.
University Place, Nebr.....	9YD	300,468	P	X	Nebraska Wesleyan University.
Westbrook, Me.....	1ZQ	200,300,425,600	P	X	Wm. H. Rocheleau.

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
1ZQ 2ZV	First district: Westbrook, Me. Second district: Richmond Hill, N. Y.	9YD 9YM 9YS	Ninth district: University Place, Nebr. Fayetteville, Ark. Columbia, Mo. (9YS.)

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name =Name of station.

G. loc. =Geographical location: O=west longitude, N=north latitude.

Call =Call letters assigned.

System=Radio system used and sparks per second.

Range =Normal range in nautical miles.

W. L. =Wave lengths assigned: Normal wave lengths in italics.

Service=Nature of service maintained:

PG=General public.

PR=Limited public.

P=private.

O=Government business exclusively.

Hours =Hours of operation:

N=Continuous service.

X=No regular hours.

m=a. m. (12m=midday).

s=p. m. (12s=midnight).

Rates =Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

Notes =Refer to notes in the Berne list.

OTHER ABBREVIATIONS.

Marconi Co.=Marconi Wireless Telegraph Co. of America.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

MOBILE, ALA.—System, Marconi, 400; W. L., 300, 445, 600.

TAMPA, FLA.—W. L., 300, 510, 600; hours, 7m-10s.

VICTOR, COLO.—W. L., 575.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

ANCON.—W. L., strike out 500; Note, Radio station operated and controlled by Panama Railroad Co., owner of vessel.

ALASKA.—Range, 150; W. L., 300, 450, 525, 600; hours, X. Note, Radio station operated and controlled by Alaska Steamship Co., owner of vessel.

ARAPAHOE.—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

AROLINE.—Range, 150; system, Marconi, 240. Note, Pacific-Alaska Navigation Co. owner of vessel.

- ARTISAN.**—Range, 250; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- BEAR.**—Range, 150.
- BRINDILLA.**—Range, 300; W. L., 300, 450, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- CAROLINA (KGB).**—W. L., 300, 450, 600.
- CAROLINIAN.**—(Name formerly *Southerner*); range, 150; system, Marconi, 240; hours, X. Notes, Radio station operated and controlled by Marconi Co. Export Leaf Tobacco Co., owner of vessel.
- CHARLES PRATT.**—Range, 300; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- CITY OF MACON.**—Name changed to *Macona*.
- EL MUNDO.**—System, Marconi, 480; hours, X; rates, North and South American service, 4 c. per word 40 c. per minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- GEORGIAN.**—System, Marconi, 480.
- GOVERNOR COBB.**—Range, 200; system, Marconi, 400; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- HARVARD.**—System, Haller-Cunningham, variable; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- HAVANA.**—W. L., 300, 450, 600.
- HERMOSA.**—Range, 150; system, Marconi, 120; W. L., 300, 500, 600; service, PR (limited to correspondence between East San Pedro and Avalon, Cal., and steamship *Cabrillo*); hours, X; rates, 1 c. per word 10 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- HURON.**—Range, 300; system, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- LARIMER.**—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- LURLINE.**—Range, 150; system, Marconi, 1,000; W. L., 300, 450, 600.
- LENAPE.**—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- MACONA.**—(Name formerly *City of Macon*); Note, Barber & Co. (Inc.), owner of vessel.
- MADISON.**—Range, 300; system, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- MASCOTTE.**—Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by Peninsular & Occidental Steamship Co., owner of vessel.
- MATSONIA.**—Range, 150; system, Marconi, 1,000; W. L., 300, 450, 600.
- MIAMI (KOZ).**—Range, 150; service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by Peninsular & Occidental Steamship Co., owner of vessel.
- MUNWOOD.**—Range, 200; system, Marconi, 240; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Notes, Radio station operated and controlled by Marconi Co. Munson Steamship Co., owner of vessel.
- NEVADA.**—System, Marconi, 120.
- NORTH AMERICA.**—Strike out all particulars.
- OLSON & MAHONY.**—Name changed to *Providencia*.
- PLATURIA.**—Range, 200; system, Marconi, 240; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram.
- PRINCESS ANNE.**—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- PROVIDENCIA.**—(Name formerly *Olson & Mahony*); call WIK; range, 200; system, Composite, 375; W. L., 300, 600; service, PG, hours, X; rates 2 c. per word 20 c. minimum per radiogram. Notes, Radio station operated and controlled by Golden Gate Transport Co. Olson & Mahony, owner of vessel.

RAVALLI.—System, Marconi, 150; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram. transoceanic service. 8 c. per word 80 c. minimum per radiogram.

RELAY.—Hours, X.

SARATOGA (KWS).—Range, 300; system, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service 4 c. per word 40 c. minimum per radiogram.

SIXAOLA.—System, Composite, 1,000.

SOUTHERNER.—Name changed to *Carolinian*.

S. O. Co. No. 91.—Range, 100; system, Marconi, 240.

S. O. Co. No. 93.—Range, 100; system, Marconi, 240.

WILLIAM CHATHAM.—Range, 500; system, Haller-Cunningham, variable; W. L., 300, 525, 600. Note, Radio station controlled by Steamer William Chatham Co., (Inc.), owner of vessel.

YALE.—System, Haller-Cunningham, variable; W. L., strike out 1,800; rates, North and South American service, 4 c. per word, 40 c. minimum per radiogram; transoceanic service, 8 c. per word, 80 c. minimum per radiogram.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out all particulars following the call signal KRU.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, only.]

AUBURN, N. Y.—Hours, 9m-9.30m, 2s-2.30s, and on Monday, Wednesday, and Friday, 7s-7.30s.

COLUMBIA, Mo. (9XQ).—Radio station operated and controlled by University of Missouri (department of physics).

St. Louis, Mo. (9XY).—Call 9XY; W. L., 300, 750, 1,000.

SCHENECTADY, N. Y. (2XA).—W. L., 500, 800, variable.

MISCELLANEOUS.

ATLANTA RADIO CLUB.

The following letter which has been received by the Bureau is published in full because of the spirit of cooperation manifested therein:

COLLEGE PARK, GA.,
January 13, 1916.

DEAR SIR: I would like to give you a few facts about the Atlanta amateurs. As president of the Atlanta Radio Club, it is my duty to see that you do not get a mistaken impression of us.

I have one of the oldest stations in this section and have watched with much interest the increase of the number during the last two years. At first I could hear only one or two amateurs. The number commenced to grow, and soon interference became a problem. By this time most of us knew each other and, being congenial, we decided to band together and discuss our problems.

There were about 10 of us to start with. We secured the use of one of the small anterooms of the Carnegie Library Building and there held our first few meetings. The club grew rapidly. The small room was soon so crowded that we had to seek larger quarters. Several of our number who were members of the local Y. M. C. A. obtained permission to use a large room on the third floor of the 10-story building. We have held our meetings there on alternate Saturday nights since last summer. A temporary aerial has been erected on top of the building and we use it for receiving tests.

After our constitution was drafted we proceeded to draw up a set of operating rules. These rules consisted of the Government Radio Service regulations and a few which dealt with the local conditions. In addition to the usual club officers we elected a club radio inspector, whose duty it is to enforce these regulations. It is also his duty to visit each station once every 60 days for the purpose of suggesting improvements.

We decided that the objects of our club should be to promote interest in radio communication and to increase knowledge and operating efficiency. To promote

these objects, we have decided to rate each member according to the percentage he makes on competitive examinations to be held every three months. These examinations will be very similar to the Government examinations as given to operators. They will consist of questions on the radio laws and regulations, questions on the theory and operation of the apparatus, and an operating speed test. We believe that by creating a spirit of rivalry among the members the interest will be stimulated and operating efficiency increased.

We want you to understand that Atlanta is as alive "wirelessly" as she is in other respects. During "electrical prosperity week" last December we were invited to enter an exhibit in the electrical show. We realized that this was beyond the scope of the average wireless club, and quite an undertaking for so young an organization. However, after discussing the matter we decided that it would be beneficial both to ourselves and to the public at large. Luckily we were allotted a space right beneath a skylight. Some of our energetic and enterprising members obtained permission and erected an aerial on top of the 17-story building on the ground floor of which the show was held. Thus it was that we were able to have a station in actual operation in the exhibit. Several of the boys were always present to explain the mysteries of wireless to the eager spectators. Taken altogether, the venture was a glorious success. The Atlanta newspapers all gave us good writeups and we secured many new members.

The probable reason for the late start of wireless in this vicinity is that there are no Government or commercial stations within 250 miles of Atlanta. In order to hear anything at all the first amateurs had to have comparatively large aërials and very sensitive instruments. Until recently these instruments were beyond the reach of all but the wealthy experimenters. (It is a curious fact that I have noticed that rich amateurs are few and far between.)

As we are so far beyond the zone of interference, most of us use transmitting waves somewhat over the limit prescribed by the Government. We do this knowingly, but we feel that we are still obeying the spirit of the law, which is to prevent interference with Government and commercial stations. If we had the faintest idea that we were causing interference we would immediately cut down our waves. We will not allow any member to use power enough to reach the coast under any conditions unless he either uses a short wave or else has a special license.

As to our loyalty to the United States, we hope that we are not less loyal than the most patriotic citizen in the whole land. We are planning to put our loyalty into practical use. We expect in the near future to form a volunteer signal corps and to practice field work under as near actual war conditions as possible. In the meantime we can be depended upon to discover and report any unneutral or unfriendly station which might attempt operation in this vicinity.

Hoping this may be of service to you, I beg to remain,

Very truly, yours,

FRANCIS F. MERRIAM.

TAHITI RADIO STATION OPENED.

The radio station erected by the French Government at Haapape, or Mahina, near Venus Point, Island of Tahiti, was declared open to receive and transmit commercial messages on December 28, 1915.

Communication with the United States will be via Samoa, and Awanui, New Zealand, thence by cable to San Francisco. The rates have not yet been established nor has the station been assigned call letters. All messages during the time of the war (sent or received) must be in French, or if in English should be accompanied by the translation. A strict censorship is exercised and code messages are not accepted.

It is not expected that the cost per word to the United States via the route indicated above will be over \$1, and it is hoped that some arrangement may be made to transmit messages via Tutuila to Honolulu and thence to San Francisco. The all-wireless route just referred to would reduce the cost per word more than one-half and would insure a saving of time.

The present installation of 10 kilowatt, with a wave length of 600 meters, can easily maintain communication with Tutuila. After

the completion of the larger station of 300 kilowatt, with a wave length of 2,500 meters, direct communication with Honolulu will be easily maintained, and even San Francisco, Sydney, and the French West Indies are expected to be reached.

The official designation of the new station has not yet been decided. It has been suggested that it should be known as the Haapape, or the Mahina, or the Point Venus Radio Station, but it is expected that the minister of war, in establishing the rates, will officially bestow the name of the Tahiti Radio Station.

The station is situated at a point some 10 miles from Papeete, and a telegraph line has been stretched between it and the post office at Papeete and the postmaster will be in charge of all messages after they have undergone the scrutiny of the censor. The completion and operation of a wireless plant has placed this colony in direct communication with the rest of the world and the business houses are now no longer dependent on the monthly mail service.

PROPOSED WIRELESS-TELEPHONE INSTALLATION IN SPAIN.

In continuation of a report dated February 1, the consul at Seville, Spain, transmits information based on an article published in the Liberal of that city, giving further details of the proposed wireless-telephone installation at that place.

The proposal contemplates stations in all of the principal cities of Spain and the adjacent Spanish territory in Africa, the Balearic Islands, the Canary Islands, and the islands of Tenerife and the Grand Canaries, with apparatus installed on the various Spanish coasting and ocean vessels.

It is said that stations of the first class (having a power of 5 kilowatts) are to be installed in Seville, Cadiz, and Cordoba in this consular district, and at Madrid, Bilbao, Ciudad Real, Cuenca, Sigüenza, Valladolid, Zaragoza, Logrona, Leon, Lugo, Granada, Lerida, Gijon, Coruna, Vigo, Malaga, Almeria, Alicante, Valencia, Barcelona, in other parts of Spain, and at Tangier, Mellilla, Palma de Mallorca, and Las Palmas in Spanish possessions, a total of 27 stations of the first class.

Stations of the second class (having a power of 2 kilowatts), six in all, are to be established at Huelva in this district, and at Larache, Ceuta, Ibiza, Ciudadela, and Tenerife.

The object of the stations is to transmit wireless-telephone messages (similar to the telephone messages now transmitted over the land lines in Spain), or when desired that parties may talk with either parties direct.

The first class, which are called "Radiotelefonemas" are to have a special tariff exactly the same as that now fixed for the land lines of Spain, with a rebate of one-half for deferred messages, and the same rebate on press messages.

In the second class, known as "Conferencias radiotelefonicas," the rates are to be for three minutes, or fraction thereof, according to distance:

Up to 100 kilometers, 0.75 peseta (approximately 15 cents).

From 100 to 200 kilometers, 1.25 pesetas.

From 201 to 300 kilometers 0.50 peseta additional, with an additional 50 centimos (approximately 10 cents) for each additional 100 kilometers.

For communication with vessels the tariff is to be 0.15 additional for each word of "Radiotelefonemas," without regard to distance. For "conferences" the price is to be computed by the land distance to the nearest station to the vessel, with an addition of 2 pesetas for each three minutes of conversation, without regard to the distance the message may be carried over the sea.

The stations of the first class are to be always open, and those of the second class from 8 in the morning until 10 at night.

CHARGING PANEL FOR STORAGE BATTERY FOR THE OPERATION OF EMERGENCY LIGHTS ON PASSENGER VESSELS.

In compliance with the regulations of the Steamboat-Inspection Service of the Department of Commerce, requiring auxiliary lights on passenger vessels, a number of such vessels at Baltimore, Md., have been equipped with emergency lights, using storage battery as the auxiliary source of power.

In order that the storage battery be properly charged, a charging panel board has been designed by Radio Inspector R. Y. Cadmus, of the Department of Commerce, which apparently meets these requirements. The board is so equipped as to automatically disconnect the charging circuit when the battery has been charged. Should the lights be used for purposes other than emergency, the sangamometer can be set so as to cut out these lights when the discharge reaches a certain point, thereby reserving the necessary emergency supply.

The board is equipped with overload and underload automatic switches, to prevent excessive charging or charging from reversed polarity.

The board is simple in construction and comparatively inexpensive.

In the event of an accident requiring the use of the lights, this is accomplished by the officer or wheelman on the bridge throwing one switch or pressing a push button on the steering head of the wheel.

The lights are placed in the main passageways, the passageways leading to the staterooms, over the doors leading to the decks, on the stairways leading to the lifeboat decks, on the boat deck in immediate vicinity of lifeboats and rafts, and to the signal lights of the vessel.

The above lights are arranged on three circuits, one for each deck, leading to the charging panel. These circuits consist of two parallel wires run through a lead cable, and the lamps connected in parallel or across the parallel wires; therefore, should one of the lamps get broken, the circuit is not interrupted. On the freight deck 3-ampere fuses are used; on the passenger deck 5-ampere fuses are used; and on the boat deck 10-ampere fuses are used. In the event of an accident, should the water reach the freight deck circuit, the 3-ampere fuses will blow, resulting in the lights on the decks above becoming more brilliant.

AMATEUR OPERATORS' LICENSES SUSPENDED.

The radio inspector, customhouse, Boston, Mass., has reported to the Bureau violations of the radio laws by amateurs in his district, resulting in the suspension of their license privilege by the Secretary of Commerce for periods of from one to three months:

Two at New Haven, Conn., reported for operating a radio station without a license for the station and without having an operator's license; licenses suspended for one month and two months, respectively.

One at Stoneham, Mass., reported for using profane and abusive language in transmitting messages; license suspended for three months.

The operators mentioned above have been notified that should they be reported for other violations of the radio laws, such leniency may not be shown them by the department.

AMATEUR PENALIZED.

An amateur radio operator at Stamford, Conn., has been indicted in the United States District Court at New Haven, Conn., for violation of sections 1, 2, and 3 of the act of August 13, 1912, entitled "An act to regulate radio communication."

The jury reported a verdict of guilty, charging the defendant with operating a radio station without a license for the station, and also without having an operator's license, and a penalty was imposed by Judge Thomas.

COMMERCIAL EXTRA FIRST-GRADE LICENSES.

During the months of February and March the Secretary of Commerce has issued commercial extra first-grade licenses to the following operators: Arthur Griffiths, William O'Connor, Fred Muller, and James B. Barriette.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, May, 1916—No. 17

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WASHINGTON, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the List of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:

E. F. SWEET,
Acting Secretary.

NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Range.	Wave lengths.	Service.	Hours.	Station controlled by—
Anchorage, Alaska ¹	NZY					Alaska Engineering Commission.
Chignik, Alaska ^{2,3}	KHC	200	300, 500 600, 1610	(13)	X	Alaska Packers' Association.
Clarks Point, Alaska ^{2,4}	KHG	200	300, 400, 500, 600	(13)	X	Do.
Koggiung, Alaska (KHB). ^{2,5}	KHB	200	300, 400, 500, 600	(13)	X	Do.
Koggiung, Alaska (KVV). ^{5,7}	KVV	100	300, 450, 600	(13)	X	Alaska Fishermen's Packing Co.
Larsen Bay, Alaska ^{2,8}	KHA	200	300, 500, 600, 1610	(13)	X	Alaska Packers' Association.
Naknek, Alaska (KHT). ^{2,9}	KHT	200	300, 500, 600, 1610	(13)	X	Do.
Port Moller, Alaska ¹⁰	KWR	150	300, 450, 600, 1610	PG	(11)	Pacific-American Fisheries.
Snag Point, Alaska ^{2,12}	KHF	200	300, 400, 500, 600	(13)	X	Alaska Packers' Association.

¹ System, Kilbourne & Clark.

² Note, Radio station open from approximately April to October each year.

³ G. loc. (approximate), O 158° 31' 30", N. 56° 17' 30"; system, Kilbourne & Clark, 1,000. Note, Radio station communicates with United States naval station at Kodiak, Alaska, and Alaska Packers' Association stations at Larsen Bay and Naknek, Alaska.

⁴ G. loc. (approximate), O 158° 31' 30", N. 58° 50' 45"; system, Kilbourne & Clark, 120. Note, Radio station communicates with stations of the Alaska Packers' Association at Snag Point, Naknek, and Kvichak, Alaska, and vessels of the association.

⁵ G. loc. (approximate), O 157° 00' 00", N. 59° 02' 30"; system, Kilbourne & Clark, 120. Note, Radio station communicates with stations of the Alaska Packers' Association at Naknek, Snag Point, and Clarks Point, Alaska, and vessels of the association.

⁶ Station is in operation from approximately July 1 to Aug. 20.

⁷ G. loc. (approximate), O 156° 55' 00", N. 59° 00' 00"; system, Kilbourne & Clark, 120.

⁸ G. loc. (approximate), O 153° 59' 40", N. 57° 37' 30"; system, Kilbourne & Clark, 1,000. Note, Radio station communicates with stations of the Alaska Packers' Association at Chignik, and Naknek, Alaska, and with the United States naval station at Kodiak, Alaska.

⁹ G. loc. (approximate), O 157° 00' 00", N. 58° 43' 30"; system, Kilbourne & Clark, 1,000. Note, Radio station communicates with United States naval stations at Kodiak, St. Paul, and Dutch Harbor, Alaska, and the vessels and land stations of the Alaska Packers' Association.

¹⁰ G. loc. (approximate), O 160° 40' 00", N. 59° 50' 00"; system, Kilbourne & Clark, 1,000.

¹¹ Hours, 8.30 a. m. to 12 m. 1 to 5 p. m., and other hours when business warrants.

¹² G. loc. (approximate), O 158° 27' 15", N. 59° 02' 30"; system, Kilbourne & Clark, 120. Note, Radio station communicates with stations of the Alaska Packers' Association at Naknek, Clarks Point, and Kvichak, Alaska, and with vessels of the association.

¹³ Service, limited commercial.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b—ship station; c—land station.]

Call signal.	Name.	Call signal.	Name.
KGW	D. N. Luckenbach.....b	KSW	Royal Arrow.....b
KHA	Larsen Bay, Alaska.....c	KUG	Munplace.....b
KHB	Koggiung, Alaska, KHB.....c	KUK	Munsong.....b
KHC	Chignik, Alaska.....c	KVV	Koggiung, Alaska, KVV.....c
KHF	Snag Point, Alaska.....c	KWR	Port Moller, Alaska.....c
KHG	Clarks Point, Alaska.....c	NZX	L. Roscoe.....b
KHT	Naknek, Alaska, KHT.....c	NZY	Anchorage, Alaska.....c
KIJ	Acme.....b	WBH	Colombia.....b
KIQ	Astral.....b	WCU	Conneaut.....b
KNS	Sucrosa.....b	WCV	The Limit.....b
KNT	Mielero.....b	WDH	Petoskey.....b
KNV	Cubadist.....b	WMU	Anne W.....b
KPK	Starlite.....b	WOL	Los Angeles.....b
KPL	Moonlite.....b	WRP ¹	Dauntless.....b
KPO	Twilight.....b	WRP ¹	Defiance.....b
KPP	Dawnlite.....b	WRP ¹	Fearless.....b
KPQ	Sunlite.....b	WRP ¹	Hercules.....b
KPR	Daylite.....b	WRP ¹	Sea Rover.....b
KSV	Standard Arrow.....b	WSU	Republic.....b

¹ This call is interchangeable among the following tugs (one set of apparatus only being used): Dauntless, Defiance, Fearless, Hercules, and Sea Rover.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Vessel.	Call signal.	System.	Wave lengths.	Owner of vessel.
Acme ^{1, 2, 3}	KIJ	Marconi.....	300, 450, 600	Standard Transportation Co.
Astral ^{1, 2, 3}	KIQ	.....do.....	300, 450, 600	Do.
Anne W.....	WMU	.....do.....	300, 600	Hosford Transportation Co.
Colombia.....	WBH	.....do.....	300, 600	Pacific Mail Steamship Co.
Conneaut ^{2, 4}	WCU	.....do.....	300, 600	Wyandotte Transportation Co.
Cubadist ^{2, 3}	KNV	.....do.....	300, 600	Cuba Distilling Co.
Dauntless ^{1, 5}	WRP ⁶	Haller-Cunningham impulse excited. ¹³	300, 600	Ship Owners & Merchants' Tugboat Co.
Dawnlite.....	KPP	Marconi.....	300, 600	Standard Oil Co. of New Jersey.
Daylite.....	KPR	.....do.....	300, 600	Do.
Defiance ^{1, 7}	WRP ⁶	Haller-Cunningham impulse excited. ¹³	300, 600	Ship Owners & Merchants' Tugboat Co.
D. N. Luckenbach ^{2, 3}	KGW	Marconi.....	300, 600	Edgar F. Luckenbach.
Fearless ^{1, 8}	WRP ⁶	Haller-Cunningham impulse excited. ¹³	300, 600	Ship Owners & Merchants' Tugboat Co.
Hercules ^{1, 9}	WRP ⁶	.....do.....	300, 600	Do.
Los Angeles ^{1, 3, 10}	WOL	Federal Poulsen Arc, 300.	300, 600 1800	Federal Telegraph Co.
L. Roscoe.....	NZX	Kilbourne & Clark	.....	Alaskan Engineering Commission.
Mielero ^{2, 3}	KNT	Marconi.....	300, 600	Cuba Distilling Co.
Moonlite.....	KPL	.....do.....	300, 600	Standard Oil Co. of New Jersey.
Munplace ^{1, 2, 3}	KUG	.....do.....	300, 600	Munson Steamship Co.
Munsomo ^{1, 2, 3}	KUK	.....do.....	300, 600	Do.
Petoskey ^{2, 11}	WDH	.....do.....	300, 600	Chicago & South Haven Steamship Co.
Republic.....	WSU	.....do.....	.....	John A. Hooper.
Royal Arrow ^{1, 2, 3}	KSW	Marconi.....	300, 450, 600	Standard Transportation Co.
Sea Rover ^{1, 12}	WRP ⁶	Haller-Cunningham impulse excited. ¹³	300, 600	Ship Owners & Merchants' Tugboat Co.
Sucrosa ^{2, 3}	KNS	Marconi.....	300, 600	Cuba Distilling Co.
Standard Arrow ^{1, 2, 3}	KSV	.....do.....	300, 450, 600	Standard Transportation Co.
Starlite.....	KPK	.....do.....	300, 600	Standard Oil Co. of New Jersey.
Sunlite.....	KPQ	.....do.....	300, 600	Do.
The Limit.....	WCV	.....do.....	.....	Whitney Bros. Co.
Twilite.....	KPO	.....do.....	300, 600	Standard Oil Co. of New Jersey.

¹ Service, PG.

² Note, Radio station operated and controlled by Marconi Co.

³ Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

⁴ Rates, 2 c. per word 20 c. minimum per radiogram.

⁵ Range, 100; hours, X; rates, 4 c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by Ship Owners & Merchants' Tugboat Co., owner of vessel.

⁶ This call is interchangeable among the following tugs (one set of apparatus only being used): Dauntless, Fearless, Defiance, Hercules, and Sea Rover.

⁷ Range, 100; hours, X; rates, 4 c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by Ship Owners & Merchants' Tugboat Co., owner of vessel.

⁸ Range, 100; hours, X; rates, 4 c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by Ship Owners & Merchants' Tugboat Co., owner of vessel.

⁹ Range, 100; hours, X; rates, 4 c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by Ship Owners & Merchants' Tugboat Co., owner of vessel.

¹⁰ Range, 200; hours, X. Note, Radio station operated and controlled by Federal Telegraph Co.

¹¹ Rates, 2 c. per word 20 c. minimum per radiogram.

¹² Range, 100; hours, X; rates, 4 c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by Ship Owners & Merchants' Tugboat Co., owner of vessel.

¹³ Sparks per second, variable.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, only.]

Station.	Call signal.	Wave lengths.	Service.	Hours.	Station controlled by—
Bozeman, Mont.	7ZD	200, 425.	P	X	R. Earl Dawes.
Indianapolis, Ind.	9YK	200, 450.	P	X	James E. Weyant.
Lacey, Wash.	7YS	300, 450, 600.	P	X	St. Martin's College.
Little Rock, Ark. (5XF).....	5XF	Variable.	P	X	Arthur R. McCreary.
Media, Pa.	3X	300, 400, 600.	P	X	Simon Delbert, jr.
Oxford, Ohio.	8YR	200, 425.	P	X	Miami University.
Philadelphia, Pa. (3XP).....	3XP	300, 400, 600.	P	X	Simon Delbert, jr.

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
3XO	Third district:		Seventh district:
3XP	Media, Pa.	7YS	Lacey, Wash.
5XF	Philadelphia, Pa. (3XP).	7ZD	Bozeman, Mont.
	Fifth district: Little Rock, Ark. (5XF).	8YR	Eighth district: Oxford, Ohio.
		9YK	Ninth district: Indianapolis, Ind.

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name =Name of station.

G. loc. =Geographical location: O=west longitude, N=north latitude.

Call =Call letters assigned.

System=Radio system used and sparks per second.

Range =Normal range in nautical miles.

W. L. =Wave lengths assigned: Normal wave lengths in italics.

Service=Nature of service maintained:

PG=General public.

PR=Limited public.

P=private.

O=Government business exclusively.

Hours =Hours of operation:

N=Continuous service.

X=No regular hours.

m=a. m. (12m=midday).

s=p. m. (12s=midnight).

Rates =Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

Notes =Refer to notes in the Berne list.

OTHER ABBREVIATIONS.

Marconi Co.=Marconi Wireless Telegraph Co. of America.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

CHIGNIK, ALASKA.—Strike out all particulars.

CLARKS POINT, ALASKA.—Strike out all particulars.

DENVER, COLO.—W. L., 300, 575; service, limited commercial; hours, X. Note. This station limited to communication with the following stations: Ajax Gold Mining Co., Victor, Colo., and H. C. Colburn, Colorado Springs, Colo.

FORT MORGAN, ALA. (WFM).—Range, 200; system, Marconi, 400; W. L., 300, 445, 600. Note. In addition to hours previously published, station is also in operation from 9.40 a. m. to 9.50 a. m., daily.

KARLUK, ALASKA.—Strike out all particulars.

KOGGIUNG, ALASKA.—Strike out all particulars.

NAKNEK, ALASKA (KHT).—Strike out all particulars.

NUSHAGAK, ALASKA (KHF).—Strike out all particulars.

PASSAGRILLE, FLA.—G., loc. (approximate), 0 82° 44' 16", N. 27° 40' 53"; range, 50; system, composite, 250; W. L., 300, 435, 600; service, PG; hours, X (this station also communicates with a land station (WIX) at St. Petersburg, Fla., the hours of operation being as follows: 8m-11m, 1s-5s, 7.30s-8s); rates, for communication with ships (cable count) per word 4 c. minimum per radiogram of 15 words 60 c., for communication with St. Petersburg, Fla. (not cable count), 10-word day message 35 c., additional words 2 c. each, 10-word night message 25 c., additional words 1 c. each, 50-word day letter 53 c., each additional 10 words or less one-fifth of initial rate, 50-word night letter 35 c., each additional 10 words or less one-fifth of initial rate.

PHOENIX, ARIZ.—Range, 300; system, Federal Poulsen arc; W. L., 3,000, 3,400; service, limited commercial; hours, 6m-6s, local standard time; rates, per radiogram of 15 words 50 c., additional words 3 c. each (domestic count). Note. This station is limited to communication with the Federal Telegraph Co.'s station at Los Angeles (KEX), Cal.

ST. PETERSBURG, FLA.—System, composite, 500; W. L., 300, 395, 600; service, limited commercial; hours, 8m-11m, 1s-5s, 7.30s-8s; rates (not cable count), 10-word day message 35 c., additional words 2 c. each, 10-word night message 25 c., additional words 1 c. each, 50-word day letter 53 c., each additional 10 words or less one-fifth of initial rate, 50-word night letter 35 c., each additional 10 words or less one-fifth of initial rate. Note. This station limited to correspondence with a land station (WRG) at Passagrille, Fla.

TAMPA, FLA.—W. L., 300, 510, 600; hours, 6m-8m, 10m-1s, 4s-7s (time of the meridian 90° west of Greenwich).

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

ARBOREAN.—Range, 300; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note. Radio station operated and controlled by Marconi Co.

ARDMORE.—System, Marconi.

BALBOA.—Strike out all particulars.

BARGE No. 1.—Name changed to *Inco No. 1*.

BUCCANEER.—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

CHESTER W. CHAPIN.—System, Fessenden, 260; W. L., 300, 550, 600.

CONCHO.—Range, 300; system, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

CONCORD.—System, Fessenden, 260; W. L., 300, 550, 600.

CONSTABLE HOOK.—(Name formerly *Henry Williams*); rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note. Radio station operated and controlled by Marconi Co.

CURACAO.—System, Marconi; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.

DADE.—Note, Radio station operated and controlled by Marconi Co.

DIANA.—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.

ECUADOR.—System, Marconi; W. L., 300, 600.

EL OCCIDENTE.—System, Marconi, 400; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

EL ORIENTE.—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

EL SOL.—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

EL SUD.—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

FRED'K. LUCKENBACH.—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.

GALATEA.—Rates, 2 c. per word 20 c. minimum per radiogram.

GARGOYLE.—Range, 200; W. L., 300, 450, 600.

GREAT NORTHERN.—W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

Constable Hook.

Note, Radio station operated and controlled by Marconi Co.

American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.

W. L., 300, 450, 600.

4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

Radio station operated and controlled by Marconi Co.

Note, Radio station

operated and controlled by Marconi Co.

American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.

American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.

rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

word 40 c. minimum per radiogram.

and transoceanic service, 8 c. per word 80 c. minimum per radiogram.

- NEVADA.—System, Marconi, 480; W. L., 300, 600. Note, Radio station operated and controlled by Marconi Co.
- NEW HAMPSHIRE (KXF).—System, Fessenden, 260; W. L., 300, 550, 600.
- NEW HAVEN (KXN).—System, Fessenden, 260; W. L., 300, 550, 600.
- NEW YORK (KUW).—Range, 300; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- NORTHERN PACIFIC.—Range, 150; W. L., 300, 465, 600.
- PACIFIC (KIL).—Name changed to *Hewitt*.
- PEARL SHELL.—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. per radiogram. Note, Radio station operated and controlled by Marconi Co.
- REMLIK.—Note, Radio station operated and controlled by Willis S. Kilmer, owner of vessel.
- SANTA CATALINA.—Range, 200.
- SANTA CECILIA.—Range, 200.
- SANTA CRUZ (WPA).—Strike out all the particulars.
- SANTIAGO.—Range, 300; system, Marconi, 1,000; W. L., 300, 450, 600; hours, N.
- SENATOR BAILEY.—System, Composite, 1,000; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Notes, Radio station operated and controlled by Marconi Co.; Gulf Refining Co., owner of vessel.
- STANDARD.—System, Marconi.
- SURUGA.—Call, KGD; range, 300; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- TORMENTER.—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- VENEZUELA.—System, Marconi; W. L., 300, 600.
- VIRGINIA (KFR).—Note, Gaston, Williams & Wigmore Steamship Corporation, owner of vessel.
- WESTWEGO.—System, Marconi, 1,000; W. L., 300, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- YAGUEZ.—W. L., 300, 450, 600.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out all the particulars following the call signals: KHA, KHB, KHC, KHF, KHG, KHT, and WHU.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, only.]

- ALAMEDA, CAL.—Strike out all the particulars.
- BURLINGTON, IOWA.—Note, Radio station operated and controlled by William W. Peters (Burlington High School).
- CHICAGO, ILL.—Strike out all the particulars.
- HARTFORD, CONN. (1ZT).—W. L., 200, 300, 425, 600; hours, X.
- NORWALK, OHIO.—Strike out all the particulars.
- OBERLIN, OHIO.—Strike out all the particulars.

SPECIAL LAND STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out all the particulars following the call signals: 6XS, 8ZI, 8ZO, and 9YH.

MISCELLANEOUS.**CHILEAN WIRELESS SERVICE.**

In view of the fact that the press has lately spoken of opening the Chilean radiotelegraphic stations for commercial use, information was requested of the Director General of Telegraphs by the commercial attaché at Santiago as to the actual state of affairs. Under date of March 2 he replied:

The radiotelegraph stations have not been opened for public service because there are some which are not yet connected with the land lines and are also lacking in certain details which will be necessary for putting them into service. This office will advise you as soon as they are opened for use. I am sending you herewith a copy of the proposed tariff and other information which you have indicated a desire to know.

A translation of portions of the decree opening the wireless stations of Chile to public service, to which the director general refers in the above note, is as follows:

Whereas, there have been established in the country several radiotelegraphic stations and some of them are united to the land lines of the State Telegraph; and

Whereas, it would appear that these offices should be utilized by the public and in view of the facts presented by the Director General of Telegraphs, acting in accordance with the Director General of the Navy.

I decree that the Director General of Telegraphs shall take charge of the telegraphic service of the radiotelegraph stations and all details relating to the public service, collection of tariffs, and the relations which this country may have with other countries or administrations. The Navy will have charge in future of everything connected with the personnel, apparatus, and actual service of the radiotelegraphic stations.

Second. The radiotelegraphic offices will be opened to the public service from time to time, as the Director General of Telegraphs may announce, beginning with the offices which are now connected with the existing land lines.

The respective charges in the service of wireless interchange, in accordance with the international convention, will be:

- (a) To a coast station, 60 centimes of a franc (11.58 cents U. S.).
- (b) To a station on board a ship, 40 centimes (7.72 cents).
- (c) Land service, 10 centimes (1.93 cents).
- (d) Intermediary transit charges from coast or ship stations, and charges fixed for any special services requested by sender.

Fourth. In making collections for aerograms from the offices of the State Telegraphs, the following rates will be charged:

- (a) Aerograms sent to ships via station on the Chilean coast, 5.50 gold pesos (\$2 U. S.) for the first 10 words and 0.55 gold peso (\$0.20) for each additional word.
- (b) For radiotelegraphic exchange between the coast offices which are on the Chilean coast, 4 Chilean paper pesos (fluctuating value, \$0.15 to \$0.18) for the first 10 words, and 40 centavos Chilean paper currency for each additional word.
- (c) For the radio telegrams which are sent to any offices of the State Telegraph land lines from Chilean ships of war by the personnel of these warships, whether officials or members of the crew, 2 paper pesos for the first 10 words and 20 centavos for each additional word.

(d) If it is necessary for a radiotelegram to pass over lines or stations of other administrations or companies, there will be collected in addition to the rates mentioned the charges corresponding to such lines or stations.

(e) Radio telegrams for the press will be given the advantage of a discount of 50 per cent of the indicated tariffs, provided they comply with the respective regulations.

Fifth. For the present there will not be admitted to the radiotelegraphic service any special service with the exception of the radiotelegrams for the press.

Sixth. There will be no franks recognized in connection with the radiotelegraphic service except on messages sent by His Excellency the President of the Republic and official messages sent by the Secretary of State, the superior officers of the Navy, commanders of Chilean ships of war, and the Director General of Telegraphs.

All funds received by the offices of the State Telegraphs in payment for radiograms will be paid into the respective fiscal treasuries for the account of the State Telegraph combined service, and these fiscal treasuries will credit these funds to the respective

department accounts maintained by the fiscal treasurer in Santiago. There will be credited to the same account by the Director General of Telegraphs, the balances received from other countries and other administrations for the value of radiotelegrams. The payment of the balances due other countries or administrations for the account of radiotelegrams will be made from this same fund, which may be drawn upon for this purpose by the Director General of Telegraphs.

Eighth. For the present, and until other instructions are issued, the international regulations appended to the radiotelegraphic convention, which was subscribed to in London in July, 1912, will be followed.

COMMERCIAL EXTRA FIRST-GRADE LICENSES FOR OPERATORS ON UNITED FRUIT CO. SHIPS.

Under date of January 26, 1916, the Tropical Radio Telegraph Co. issued the following circular pointing out to operators on United Fruit Co. ships the desirability of securing commercial extra first-grade licenses:

TO ALL OPERATORS:

Ship operators are again reminded that it is highly desirable to hold the extra first-grade commercial operators' licenses issued by the Department of Commerce. The possession of such a license is a distinct mark of ability, and in considering men for promotion to positions as chief operators on board ship, as well as trick operators at shore stations, those holding an extra grade license will be given preference regardless of their length of service.

In general, it should be the aim of every radio operator on board a United Fruit Co. ship to hold an extra grade license.

Operators who obtain an extra grade license should notify the general office promptly, giving the license number and date issued.

Yours very truly,

GEO. S. DAVIS,
General Superintendent.

The commercial extra first-grade license is the highest class of license, and is issued by the Department of Commerce to radio operators who pass a special examination demonstrating unusual experience and skill. These licenses are given consideration by the Civil Service Commission in examinations for positions requiring knowledge of radiotelegraphy when experience is rated as a part of such examinations. To be eligible for the examination for the commercial extra first-grade license applicants must hold commercial first-grade licenses, and their certificates of skill in radio communication, issued under the act of June 24, 1910, or licenses under the act of August 13, 1912, must record 18 months' satisfactory commercial service at sea or at land stations, either or both, during the two years previous to the filing of the application for examination, as shown by indorsement on the license service records, or other satisfactory evidence, and provided that the applicants have not been penalized for a violation of the radio laws and regulations.

A speed of at least 30 words per minute, Continental Morse, and 25 words per minute, American Morse (five letters to the word), must be attained. The technical questions and the questions of the radio laws and regulations will be considerably wider in scope than those for commercial first grade, and a higher percentage will be required.

All examination papers, including the code test sheets, are marked and forwarded to the Commissioner of Navigation with a recommendation by the radio inspector or examining officer. Examination papers are marked upon the basis of 100, and licenses are recommended only if 80 or better is attained.

Licenses of this grade are issued by the Commissioner of Navigation, indorsed by the Secretary of Commerce, and delivered to the successful applicant through the examining officer.

UTILIZATION OF WIRELESS FOR TRANSMISSION OF WEATHER OBSERVATIONS.

At the request of the Weather Bureau arrangements have been made by the United States Bureau of Lighthouses for taking weather observations on the light vessels at Nantucket Shoals, Mass.; Diamond Shoals, N. C.; Frying Pan Shoals, N. C.; and Heald Bank, Tex. These light vessels are all equipped with radio, by means of which observations may be transmitted to any point desired.

LOS ANGELES AMATEURS FINED FOR RADIO VIOLATIONS.

On March 23, 1916, four amateurs, all residents of Los Angeles, Cal., appeared before Judge Oscar A. Trippet, of the United States District Court, and entered pleas of guilty to Federal indictments returned last December, charging them with operating radio stations without first having obtained licenses from the Government. Fines were imposed by Judge Trippet and the offenders were admonished to be more cautious in future.

The trial of two other amateurs, who pleaded not guilty, has been set for next July.

The maximum penalty for the above violation is a fine of \$100 and imprisonment for a period of two months.

BOSTON AMATEUR PENALIZED.

On April 19, 1916, the radio inspector at Boston, Mass., reported an amateur in his district for violation of sections 1, 3, and 7 of the act of August 13, 1912. The case was referred to the United States district attorney for prosecution. A verdict of guilty was rendered in the district court and a fine imposed.

The maximum penalty for the above violation is a fine of \$500 and confiscation of the apparatus unlawfully used.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, June, 1916—No. 18

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WASHINGTON, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the List of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:

E. F. SWEET,
Acting Secretary.

NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Call signal.	Range.	Wave length.	Service.	Hours.	Station controlled by—
Conneaut Harbor, Ohio. ¹	WEV	200	300, 475, 540, 600	PR	X	Marquette & Bessemer Dock & Navigation Co.
Davenport, Iowa ²	WPT	300	500	(3)	X	Western Flour Mill Co. (International Milling Co.).
New Prague, Minn. ³ ..	WPU	300	500	(3)	X	New Prague Flouring Mill Co. (International Milling Co.).

¹ G. loc., approximate, O 80° 36' 00", N. 41° 57' 00"; system, Kilbourne & Clark; 240; rates, 3 c. per word 30 c. minimum per radiogram. Note, The station is restricted to communication with the vessels *Marquette & Bessemer No. 1* and *Marquette and Bessemer No. 2*.

² G. loc., approximate, O 90° 35' 10", N. 41° 31' 26"; system, Marconi.

³ Service limited commercial. Note, The station communicates with stations of the International Milling Co. on business of the company.

⁴ G. loc., approximate, O 93° 31' 12", N. 44° 32' 39"; system, Marconi.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Vessel.	Call signal.	System.	Wave length.	Owner of vessel.
Bayamon.....	KDX	Marconi.....	300, 600	Vacuum Oil Co.
Henry J. Biddle.....	WOW	Kilbourne & Clark.....	300, 600	Columbia Contract Co.
Bramell Point.....	KRO	Marconi.....	300, 600	Vacuum Oil Co.
Campana ¹	KOM	Marconi, 1,000.....	300, 450, 600	Standard Oil Co. of New Jersey.
Edgar F. Luckenbach ²	KGK	Kilbourne & Clark, 1,000.....	300, 450, 530, 600	Luckenbach Co. (Inc.).
Gov. Forbes ³	WJA	Halcum, variable.....	300, 600	Ynchanti Co.
Harry Luckenbach ⁴	KGX	Marconi, 1,000.....	300, 450, 600	Edgar F. Luckenbach.
Hiram B. Everest.....	KRS	Marconi.....	300, 600	Vacuum Oil Co.
Mooremack.....	WCL	do.....	300, 600	Moore & McCormick Co. (Inc.).
Navahoe ⁵	KOR	do.....	300, 600	R. Lawrence Smith (Inc.).
El Capitan (name formerly Oliver J. Olsen). ⁶	WNB	Marconi, 480.....	300, 600	Standard Oil Co. of New Jersey.
Samson.....	WOS	Kilbourne & Clark.....	300, 600	Columbia Contract Co.
Vigilant ⁷	KPG	Marconi.....	300, 600	Clinchfield Navigation Co.

¹ Range, 200; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.

² Range, 250; service, PG; hours, X; rates, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Luckenbach Co. (Inc.), owner of vessel.

³ Range, 200; service, PG; hours, N; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Ynchanti Co., owner of vessel.

⁴ Range, 200; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.

⁵ Note, Radio station operated and controlled by Marconi Co.

⁶ Range, 200; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.

⁷ Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KDX	Bayamon.....b	WCL	Mooremack.....b
KGK	Edgar F. Luckenbach.....b	WEV	Conneaut Harbor, Ohio.....c
KGX	Harry Luckenbach.....b	WJA	Gov. Forbes.....b
KOM	Campana.....b	WNB	El Capitan.....b
KOR	Navahoe.....b	WOS	Samson.....b
KPG	Vigilant.....b	WOW	Henry J. Biddle.....b
KRO	Bramell Point.....b	WPT	Davenport, Iowa.....c
KRS	Hiram B. Everest.....b	WPU	New Prague, Minn.....c

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, only.]

Station.	Call signal.	Wave length.	Service.	Hours.	Station controlled by—
Cambridge, Mass. (1XU).....	1XU	600, Variable.	P	X	Cutting & Washington (Inc.).
Cleveland, Tenn.	5ZII	425	P	X	W. O. Horner.
Denver, Colo. (9ZF).....	9ZF	425, 550, 800	P	X	Company A, Signal Corps, National Guard of Colo- rado.
Elmira, N. Y.	8ZE	200, 425	P	X	Harry E. Fitch.
Ithaca, N. Y. (8XT).....	8XT	Variable.	P	X	Cornell University.
Oil City, Pa.	8YW	200, 450	P	X	Clarence M. Wickes.
Pittsburgh, Pa. (8YZ).....	8YZ	200, 450	P	X	Charles C. Dunning (Pea- body High School).
Shreveport, La.	5ZS	200, 425	P	X	Willie E. Antony.
Springfield, Mass.	1ZS	200, 300, 425, 600.	P	X	George U. Readio.

SPECIAL LAND STATIONS GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
1XU	First district:	8XT	Eighth district:
1ZS	Cambridge, Mass. (1XU).	8YW	Ithaca, N. Y. (8XT).
5ZH	Springfield, Mass.	8YZ	Oil City, Pa.
5ZS	Fifth district:	8ZE	Pittsburgh, Pa. (8YZ).
	Cleveland, Tenn.	9ZF	Elmira, N. Y.
	Shreveport, La.		Ninth district: Denver, Colo. (9ZF).

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name =Name of station.

G. loc. =Geographical location: O=west longitude, N=north latitude.

Call =Call letters assigned.

System=Radio system used and sparks per second.

Range =Normal range in nautical miles.

W. L. =Wave lengths assigned: Normal wave lengths in italics.

Service=Nature of service maintained:

PG=General public.

PR=limited public.

P=private.

O=Government business exclusively.

Hours =Hours of operation:

N=Continuous service.

X=No regular hours.

m=a. m. (12m=midday).

s=p. m. (12s=midnight).

Rates =Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

Notes =Refer to notes in the Berne list.

OTHER ABBREVIATIONS.

Marconi Co.=Marconi Wireless Telegraph Co. of America.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

AKUTAN, ALEUTIAN ISLANDS, ALASKA.—Range, 50; system, composite, 500; W. L., 300, 525, 600; service, limited commercial. Note, The station is restricted to correspondence of a private nature with the United States naval station at Dutch Harbor, Alaska.

ANCHORAGE, ALASKA.—G. loc., approximate, O 149° 50' 00'', N. 61° 16' 00''; range, 150; system, Kilbourne & Clark, 1,000; W. L., 300, 600, 750, 1,000; service, O; hours, X.

ASTORIA, OREG.—G. loc., approximate, O 123° 51' 00'', N. 46° 11' 00''; range, 300; W. L., 300, 600. Strike out the following note: The long wave lengths are used for limited public service with Ketchikan, Alaska; rates, for commercial business, \$1.25 for 10 words (10 word minimum) and 12 c. for each additional word, domestic count. For press despatches, 3 c. per word.

BROOKLYN, N. Y.—Range, 500; system, Fessenden, 1,000; W. L., 300, 550, 600, 1,650, 2,000; hours, 4m–8m; 5s–9s, time of the meridian 75° west of Greenwich. Note, Radio station operated and controlled by National Electric Signaling Co.

FORT MILLS, CORREGIDOR ISLAND, MANILA BAY, P. I.—G. loc., E 120° 34' 40''. N. 14° 22' 52''; Range, 35; system, U. S. Army, 1,000; W. L., 600, 825. Note, Radio station operated and controlled by United States War Department.

HILCREST, DALY CITY, CAL.—System, Marconi, 520.

JUALIN, ALASKA.—W. L., 300, 500, 600, 1,980; service, PG; hours, 8.30m–8.45m; 1.30s–1.45s; 7.30s–7.45s; rates, PG service with ships, 6 c. per word 60 c. minimum per radiogram. Note, The station also conducts private correspondence with the Marconi station at Juneau, Alaska.

KAUNAKAKAI, ISLAND OF MOLOKAI, T. H.¹—Range, 30; W. L., 300, 450, 600; hours, 7m–12m; 1s–5:30s. Note, The station is restricted to communication with Lahaina.

KAWAIHAE, ISLAND OF HAWAII, T. H.¹—W. L., 300, 575, 600; service, limited commercial; hours, 7m–12m; 1s–5:30s. Note, The station is restricted to communication with Wahiawa, Lahaina, and Lihue.

LAHAINA, ISLAND OF MAUI, T. H.¹—W. L., 300, 575, 600; service, limited commercial; hours, 7m–12m; 1s–5:30s. Note, The station is restricted to communication with Wahiawa, Kawaihae, Kaunakakai, and Lihue.

LIHUE, ISLAND OF KAUAI, T. H.¹—System, Marconi, 565; W. L., 300, 575, 600; service, limited commercial; hours, 7m–12m; 1s–5:30s. Note, The station is restricted to communication with Wahiawa, Kawaihae, and Lahaina.

¹ Rates for interisland messages: Ordinary messages, per word, 15 c.; minimum charge, \$1.50; address and signature counted; press messages, per word, 7½ c.; minimum charge, \$1; address and signature counted; cipher or code messages, origin and destination Hawaiian Islands, per word 50 c.; minimum charge, \$1.50; address and signature counted. Cablegrams or trans-Pacific wireless messages in cipher, code, foreign, or English will be accepted and forwarded at ordinary rates plus the forwarding charges of the cable or wireless company, when such messages are to be delivered to them for forwarding; no minimum charge to apply. Double-rush messages will be charged for at double rate. Messages filed in other than English will be charged for at the code rate. A night letter of 25 words, including address and signature, from any point in the Hawaiian Islands to any other point in the Hawaiian Islands, \$1.50; each additional word above twenty-five, 5 c.

- NAKENEK, ALASKA (KMK).**—System, Composite, 400; W. L., 300, 500, 600; service, limited commercial. Note, The station is limited to correspondence with stations of the Red Salmon Canning Co., and the U. S. naval stations at St. George and St. Paul (Pribilof Islands) and Kodiak, Alaska.
- PORT ARTHUR, TEX.**—Hours, 6:30m–12m; 12:30s–6s; 6:30s–8:30s.
- ROCHE HARBOR, WASH.**—W. L., 300, 600, 1,800.
- SAYVILLE, L. I.**—G. loc., 73° 06' 12'', N. 40° 14' 46''; range, 4,500; W. L., 3,900, 4,700, 5,200, 6,300, 7,800, 9,400; rates, transoceanic service, 25 c. per word. Notes, Radio station temporarily operated and controlled by United States Naval Radio Service, Radio, Va.; accounts handled by Atlantic Communication Co., 47 West Street, New York, N. Y. The station communicates with Nauen, Germany.
- TUCKERTON, N. J.**—Range, 4,000; system, Goldschmidt and arc; W. L., 8,600; service, PR; hours, N; rates, transoceanic service, 25 c. per word. Notes, Radio station temporarily operated and controlled by United States Naval Radio Service, Radio, Va. The station communicates with Eilvese, Germany.
- UGASHIK, ALASKA.**—W. L., 300, 500, 600; service, limited commercial. Note, The station is limited to correspondence with station of the Naknek Packing Co., Naknek, Alaska (KMK).
- WAHIAWA, ISLAND OF OAHU, T. H.**¹—O. 158° 02' 37'', N. 21° 29' 28''; W. L., 300, 575, 600; service, PG; hours, PG service continuous; special interisland service, 7m–12m; 1s–5:50s. Note, The station also conducts special service, communicating with Kawaihae, Lahaina, and Lihue (Hawaii), Apia (Samoa), and Papeete (Tahiti).

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

- ACUSHNET.**—W. L., 300, 600.
- ADELINE SMITH.**—Range, 150; system, Marconi, 480.
- ALOHA.**—Note, Radio station operated and controlled by Arthur Curtiss James, owner of vessel.
- AMAZONIA.**—Range, 200; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X.
- ABOLINE.**—System, Marconi, 480.
- ATLAS (WTT).**—System, Marconi, 1,000; W. L., 300, 450, 600. Note, Standard Oil Co. of California, owner of vessel.
- BAY STATE.**—Range, 200; system, Marconi, 480.
- BEAR (WWD).**—Range, 150.
- BERLIN.**—System, Marconi, 400.
- BOSTON.**—System, Fessenden, 260; W. L., 300, 550, 600.
- BRADFORD.**—Range, 200; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- BREAKWATER.**—Range, 150; system, Marconi, 400; hours, N. Note, Southern Pacific Co., owner of vessel.
- C. A. CANFIELD.**—Range, 100; system, Marconi, 300; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

¹ Rates for interisland messages: Ordinary messages, per word, 15 c.; minimum charge, \$1.50; address and signature counted; press messages, per word, 7½ c.; minimum charge, \$1; address and signature counted; cipher or code messages, origin and destination Hawaiian Islands, per word 50 c.; minimum charge, \$1.50; address and signature counted. Cablegrams or trans-Pacific wireless messages in cipher, code, foreign, or English will be accepted and forwarded at ordinary rates plus the forwarding charges of the cable or wireless company, when such messages are to be delivered to them for forwarding; no minimum charge to apply. Double-rush messages will be charged for at double rate. Messages filed in other than English will be charged for at a code rate. A night letter of 25 words, including address and signature, from any point in the Hawaiian Islands to any other point in the Hawaiian Islands, \$1.50; each additional word above twenty-five, 5 c.

² Rate to Apia and Papeete, 50 c. per word; no minimum.

- CADDO.—System, Marconi, 1,000; W. L., 300, 450, 600; hours, X. Note, Radio station operated and controlled by Marconi Co.
- CAPTAIN A. F. LUCAS.—Range, 150; system, Marconi; W. L., 300, 450, 600.
- CAPTAIN A. M. WETHERILL.—System, United States Army, 1,000; W. L., 400; hours, X. Note, Radio station operated and controlled by United States War Department, owner of vessel.
- CAPTAIN BARRETT.—System, United States Army, 1,000; W. L., 400; hours, X. Note, Radio station operated and controlled by United States War Department, owner of vessel.
- CAPTAIN CHAS. W. ROWELL.—System, United States Army, 1,000; W. L., 400; hours, X. Note, Radio station operated and controlled by United States War Department, owner of vessel.
- CAPTAIN JAMES FORNANCE.—System, United States Army, 1,000; W. L., 400; hours, X. Note, Radio station operated and controlled by United States War Department, owner of vessel.
- CELILO.—Range, 150.
- CITY OF ROCKLAND.—System, Marconi, 400.
- CITY OF SOUTH HAVEN.—System, Marconi, 480.
- COALINGA.—Range, 150; system, Federal-Poulsen arc, 250; W. L., 300, 600, 1,800.
- COL. E. L. DRAKE.—System, Marconi, 1,000; W. L., 300, 450, 600.
- CROOK.—Range, 200 during day, 900 at night; system, United States Army, 1,000; W. L., 300, 600. Note, Radio station operated and controlled by United States War Department, owner of vessel.
- CURACAO.—Range, 150; system, Marconi, 400; service, PG; hours, N.
- DADE.—Range, 200; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, N; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- DAWNLITE.—Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- DAYLITE.—Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- DE SOTO.—Range, 150; system, Marconi, 1,000; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- EOCENE.—System, Telefunken, 1,000; W. L., 300, 600; service, PG; hours, 9m-12m: 2s-5s; 8s-10:30s; rates 4 c. per word 40 c. minimum per radiogram. Note, Standard Transportation Co., owner of vessel.
- FLORENCE LUCKENBACH.—Note, Luckenbach Co., Inc., owner of vessel.
- FRED'K LUCKENBACH.—Range, 200; system, Marconi, 240; service, PG; hours, X.
- GENERAL A. M. RANDOL.—System, United States Army, 1,000; W. L., 400; hours, X. Note, Radio station operated and controlled by United States War Department, owner of vessel.
- GENERAL E. O. C. ORD.—Range, 100; system, United States Army, 1,000; hours, X. Note, Radio station operated and controlled by United States War Department, owner of vessel.
- GENERAL HARVEY BROWN.—System, United States Army, 1,000; W. L., 400; hours, X. Note, Radio station operated and controlled by United States War Department, owner of vessel.
- GENERAL HENRY J. HUNT.—Range, 100; system, United States Army, 1,000; W. L., 600; hours, X. Note, Radio station operated and controlled by United States War Department, owner of vessel.
- GENERAL HENRY KNOX.—Range, 100; system, United States Army, 1,000; W. L., 600; hours, X. Note, Radio station operated and controlled by United States War Department, owner of vessel.
- GENERAL R. B. AYRES.—Range, 100; system, United States Army, 1,000; W. L., 600; hours, X. Note, Radio station operated and controlled by United States War Department, owner of vessel.

- GENERAL ROBERT ANDERSON.—System, United States Army, 1,000; W. L., 400; hours, X. Note, Radio station operated and controlled by United States War Department, owner of vessel.
- GENERAL ROYAL T. FRANK.—Range, 100; system, United States Army, 1,000; W. L., 600; hours, X. Note, Radio station operated and controlled by United States War Department, owner of vessel.
- GENERAL S. N. MILLS.—System, United States Army, 1,000; W. L., 600; hours, X. Note, Radio station operated and controlled by United States War Department, owner of vessel.
- GEORGIANA.—Range, 150; system, Marconi, 120; W. L., 300, 600; service, PG; hours, X; rates, North and South American service 4 c. per word 40 c. minimum per radiogram; transoceanic service 8 c. per word 80 c. minimum per radiogram.
- GLOUCESTER (KQG).—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram; transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- HAMILTON.—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram; transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- HATTIE LUCKENBACH.—Note, Luckenbach Co., Inc., owner of vessel.
- INCO No. 1.—Range, 150; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X.
- J. A. CHANSLOB.—System, Federal-Poulsen arc, 300; W. L., 300, 600, 1,800. Note, Radio station operated and controlled by Federal Telegraph Co.
- J. A. MOFFETT.—W. L., 300, 600, 1,800.
- JEFFERSON (KOD).—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- J. L. LUCKENBACH.—Note, Luckenbach Co. (Inc.), owner of vessel.
- KENTRA.—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80c. minimum per radiogram.
- KOREA.—System, Marconi, 480.
- KVICHAK.—W. L., 300, 400, 500, 600.
- LAKELAND.—System, Marconi, 480.
- LAKEPORT.—Range, 100; system, Marconi, 480; service, PG; hours, X.
- LAKEWOOD.—Range, 100; system, Marconi, 480; service, PG; hours, X.
- LANSING.—Range, 150; system, Federal-Poulsen arc, 250; W. L., 300, 600, 1,800; hours, X. Note, Radio station operated and controlled by Federal Telegraph Co.
- LEWIS LUCKENBACH.—Note, Luckenbach Co. (Inc.), owner of vessel.
- L. ROSCOE.—Range, 150; system, Kilbourne & Clark, 1,000; W. L., 300, 600, 750; service, O; hours, X. Note, Alaska Engineering Commission, owner of vessel.
- MATINICOCK.—Range, 200; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X.
- MEXICANO.—System, Marconi, 400; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- MOONLITE.—Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- MORRILL.—W. L., 300, 600.
- MUNPLACE.—Range, 200; system, Marconi, 1,000; W. L., 300, 450, 600; hours, X.
- NEBRASKAN.—Name changed to *Rockingham*.
- NUSHAGAK.—W. L., 300, 400, 500, 600.
- OLEUM.—System, Federal-Poulsen arc, 250.
- PAMLICO.—W. L., 300, 600.
- PAN-AMERICAN.—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- PAVLOF.—Strike out all particulars.
- PETROLITE.—W. L., 300, 450, 600; hours, X.
- POLARINE.—W. L., 300, 450, 600; hours, X.

- REPUBLIC.**—Range, 150; system, Marconi, 480; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- RICHARD.**—Strike out all particulars.
- ROANOKE.**—Strike out all particulars.
- ROCKINGHAM.**—(Name formerly *Nebraskan*); system, Marconi, 1,000; W. L., 300, 450, 600. Note, Radio station operated and controlled by Marconi Co.; Garland Steamship Corporation, owner of vessel.
- ST. HELENS.**—Strike out all particulars.
- SAN JOSE.**—System, Marconi, 480.
- SANTA CLARA (WBA).**—System, Marconi, 480; hours, X.
- SATSUMA.**—Note, Barber & Co. (Inc.), owner of vessel.
- SIBERIA.**—Note, International Mercantile Marine Co., owner of vessel.
- SNOHOMISH.**—W. L., 300, 600.
- SOMERSET (KQS).**—System, Marconi, 1,000; W. L., 300, 450, 600; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- STARLITE.**—Service, PG; rates, North and South American service 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- SUNLITE.**—Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- TAMESI.**—Range, 200; system, Marconi, 480; service, PG; hours, X.
- THE LIMIT.**—Range, 100; system, Marconi, 480; W. L., 300, 600; service, PG; hours, X; rates, 2 c. per word 20 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- TWILITE.**—Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.
- VANADIS.**—W. L., 300, 600.
- VENETIA.**—Range, 100; system, Marconi, 1,000; W. L., 300, 600; service, P; hours, X.
- VIRGINIA (WFH).**—System, Marconi, 480.
- VIRGINIA (WKV).**—Hours, X.
- WALLULA.**—System, Marconi, 120.
- WASHTENAW.**—Strike out all particulars.
- WHITTIER.**—Range, 150; system, Federal-Poulsen arc, 250; W. L., 300, 600, 1,800; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Federal Telegraph Co.
- WM. F. HERRIN.**—Range, 150; system, Federal-Poulsen arc, 300; W. L., 300, 600, 1,800. Note, Radio station operated and controlled by Federal Telegraph Co.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out all the particulars following the call signals: WLK, WNO, WNY, WRR, WTH.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the list of Radio Stations of the United States, edition of July 1, 1915, only.]

FAYETTEVILLE, ARK.—Call, 5YM.

IOWA CITY, IOWA.—500, variable under 600 and over 1,600.

LINCOLN, NEBR.—Strike out all the particulars.

ST. LOUIS, Mo. (9YR).—Change to St. Louis, Mo. (9XY).

SPECIAL LAND STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out all the particulars following the call signal: 9XT.

MISCELLANEOUS.

TRANSMISSION OF WEATHER REPORTS BY NAVAL RADIO STATIONS.

Through cooperation with local offices of the United States Weather Bureau, weather forecasts are sent broadcast to sea through naval coast radio stations at certain times, varying with the locality. Coast stations are generally prepared to give local forecasts to passing vessels without charge, on request. Storm warnings are sent whenever received and the daily weather bulletins are distributed by the naval radio stations at Arlington, Va., and Key West, Fla., a few minutes after the 10 p. m. time signal. These bulletins consist of two parts.

The first part contains code letters and figures which express the actual weather conditions at 8 p. m., seventy-fifth meridian time, on the day of distribution, at certain points along the eastern coast of North America, one point along the Gulf of Mexico, and one at Bermuda.

The second part of the bulletin contains a special forecast of the probable winds to be experienced a hundred miles or so off shore, made by the United States Weather Bureau, for distribution to shipmasters. The second part of the bulletin also contains warnings of severe storms along the coasts, as occasions for such warnings may arise.

Immediately following this bulletin, a weather bulletin for certain points along the Great Lakes is sent broadcast by the naval radio station at Arlington, Va., consisting of two parts. The first part contains code letters and figures which express the actual weather conditions at 8 p. m., seventy-fifth meridian time, on the day of distribution, at certain points along the Lakes. The second part of the bulletin contains a special forecast of the probable winds to be experienced on the Lakes during the season of navigation—about April 15 to December 10.

The points for which weather reports are furnished are designated as follows: *For Atlantic coast and Gulf points*, S=Sydney, T=Nantucket, DB=Delaware Breakwater, H=Hatteras, C=Charleston, K=Key West, P=Pensacola, and B=Bermuda; *for points on the Great Lakes*, Du=Duluth, M=Marquette, U=Sault Ste. Marie, G=Green Bay, Ch=Chicago, L=Alpena, D=Detroit, V=Cleveland, and F=Buffalo.

All bulletins begin with the letters U. S. W. B. (United States Weather Bureau) and the weather conditions follow. The first three figures of a report represent the barometric pressure in inches (002=30.02); the next figure, the fourth in sequence, represents the direction of the wind to the eight points of the compass: 1=north, 2=northeast, 3=east, 4=southeast, 5=south, 6=southwest, 7=west, 8=northwest, and 0=calm. The fifth figure represents the force of the wind on the Beaufort scale, on page following.

BEAUFORT SCALE OF WIND FORCE.

Number and designation.	Statute miles per hour.	Nautical miles per hour.
0 Calm.....	0 to 3	0 to 2.6
1 Light air.....	8	6.9
2 Light breeze.....	13	11.3
3 Gentle breeze.....	18	15.6
4 Moderate breeze.....	23	20.0
5 Fresh breeze.....	28	24.3
6 Strong breeze.....	34	29.5
7 Moderate gale.....	40	34.7
8 Fresh gale.....	48	41.6
9 Strong gale.....	56	48.6
10 Whole gale.....	65	56.4
11 Storm.....	75	65.1
12 Hurricane.....	90 and over.	78.1 and over.

In order to simplify the code, no provision has been made for wind force greater than 9, strong gale, on the Beaufort Scale. Whenever winds of force greater than 9 occur, the number representing them is given in words instead of figures, thus: Ten, eleven, etc.

EXAMPLES OF CODE.

U S W B S 96465 T 91674 DB 94686 H 99886 C 01214
K 02622 P 03613 B 00065.

Translation.

United States Weather Bureau.

Station.	Pressure.	Wind.	
		Direction.	Force. ¹
Sydney.....	29.64	SW	5
Nantuc, et.....	29.16	W	4
Delaware Breakwater.....	29.46	NW	6
Hatteras.....	29.98	NW	6
Charleston.....	30.12	N	4
Key West.....	30.26	NE	2
Pensacola.....	30.36	N	3
Bermuda.....	30.00	SW	5

¹ See Beaufort Scale.

U S W B Du 95826 M 97635 U 00443 G 96046 Ch 95667
L 00644 D 00842 V 01054 F 01656

Translation.

United States Weather Bureau.

Station.	Pressure.	Wind.	
		Direction.	Force. ¹
Duluth.....	29.58	NE	6
Marquette.....	29.76	E	5
Sault Ste. Marie.....	30.04	SE	3
Green Bay.....	29.60	SE	6
Chicago.....	29.56	SW	7
Alpena.....	30.06	SE	4
Detroit.....	30.08	SE	2
Cleveland.....	30.10	S	4
Buffalo.....	30.16	S	6

¹ See Beaufort Scale.

TRANSMISSION OF TIME SIGNALS BY NAVAL RADIO STATIONS.

The transmission of time signals to vessels at sea by means of radiotelegraphy was first accomplished in the United States in 1905, and this service, enlarged and extended, has continued to the present time. This service is of the greatest value to mariners, as it furnishes a means by which the time, as given by the transmitted signals, may be compared with a ship's chronometer and the error of the chronometer found. Similar comparisons over a number of days enable data to be obtained by which not only the error may be found, but also the chronometer rate; that is, the rate at which it is gaining or losing.

The noontime signals on the Atlantic coast are sent out through the coast radio stations by connection with Western Union telegraph lines from the United States Naval Observatory at Washington, D. C. By the operation of proper relays in electrical circuits, the beats of the seconds of a standard clock in the observatory are sent out broadcast as a series of radio dots, commencing five minutes before the time of the final signal. By omitting certain dots in a series, the comparison between the dots and the beats of the chronometer seconds can be checked until the instant of local noon (seventy-fifth meridian time) is reached. This is marked by a longer dot, which gives the time of exact noon. A comparison with the chronometer time at that instant gives its error referred to the seventy-fifth meridian time. Applying the difference in longitude, namely, five hours, between the seventy-fifth meridian and Greenwich, which is the standard meridian (or 0° longitude), the error of the chronometer referred to Greenwich time is determined.

Time signals are now sent out on the Atlantic coast only through the radio stations at Arlington, Key West, and New Orleans. Signals from Arlington, which reach a zone formerly served by other coast stations, are sent out every day in the year twice a day, viz, at noon and 10 p. m., seventy-fifth meridian time. Time signals from Key West and New Orleans are sent out daily, including Sundays and holidays, commencing at 11.55 a. m., seventy-fifth meridian time, and ending at local noon.

In case of failure of the Arlington high-power station, the signals are sent out by the small set in the same station, and the stations at Boston, Newport, Norfolk, and Charleston are notified, and they each send the signals broadcast.

On the Pacific coast the time signals are sent broadcast to sea through the naval radio stations at Mare Island, Eureka, Point Arguello, and San Diego, Cal., and at North Head, Wash. The controlling clock for each station is in the naval observatory at the Mare Island Navy Yard. Signals from Mare Island are sent out every day from 11.55 to noon, and from 9.55 to 10 p. m., one hundred and twentieth meridian standard time. Those from North Head, Eureka, and San Diego are sent out daily, excluding Sundays and holidays, from 11.55 to noon, one hundred and twentieth meridian standard time.

To get the maximum clearness of signals, the receiving circuit should be tuned to that of the sending station. Arlington and Mare Island send on a 2,500-meter wave length, North Head and San Diego on a 2,000-meter wave length, Eureka on a 1,400-meter wave

length, and Key West and New Orleans on a 1,000-meter wave length. On the completion of the new radio station at the training station, Great Lakes, time signals will be transmitted from that station for the benefit of shipping on the Great Lakes, as well as the weather reports for that region, now transmitted by Arlington after the Atlantic coast weather bulletin, following the 10 p. m. time signals.

CHILEAN WIRELESS SERVICE.

The Bureau has been informed by the Chilean Administration, through the Bureau of the International Telegraphic Union, Radiotelegraphic Service, Berne, Switzerland, of the opening to public service early in April of the radiotelegraphic stations Valparaiso, Llanquihue, Frutillar, and Punta Arenas.

NOTICE TO AMATEURS.

The new list of "Radio Stations of the United States," edition of July 1, 1916, will contain the names, addresses, and call letters of all licensed amateurs of record in the Bureau on June 30, 1916, and where applications for station licenses are received after June 30, the names will not be published until the 1917 list is issued.

All amateurs who desire to have their names listed in the 1916 book should make an effort to have their licenses renewed without delay.

AN AMENDMENT TO RADIO REGULATIONS.

[To be cut out and pasted in your copy.]

Insert the following regulation which is made pursuant to the act of August 13, 1912, following paragraph 152, page 66, of the Radio Laws and Regulations of the United States:

Paragraph 152-a, page 66.

Holders of commercial extra first-grade radio operators' licenses may be issued renewal of such licenses without examination, provided the service records on the backs of the licenses properly certify to 12 months' satisfactory service in a land or ship station open to general public service, at least 6 months of which must have been served during the last 12 months of the license period.

However, holders of commercial extra first-grade licenses now employed as radio inspectors, radio instructors, or similar occupations requiring exceptional qualifications where the duties require the testing, or demonstrating, or otherwise using commercial radio apparatus and the telegraph codes, may be issued renewals of their licenses without reexamination, provided, in addition to the above, they can show satisfactory evidence of such service covering a period of 18 months out of the two-year license period. Where the applicant has not used regularly the telegraph codes, he will be given the code examination required in the original examination or, if he has used only one code, he will be examined in the code not used.

The service record shown on the licenses must be transcribed on Form 756.

The license may be marked "Expired" in red across the face and returned to the operator, if desired. The action taken should be noted on Form 756.

Where the record on the reverse side of the license does not show the service performed, the evidence submitted as proof of such service must be transmitted to the Bureau with Form 756.

Transcriptions of code tests must be submitted to the Bureau.

PORTUGUESE CENSORSHIP.

The Bureau has been informed through the International Telegraphic Bureau at Berne that beginning May 1 the Portuguese colonies will admit for transmission by their lines only private telegrams and radiograms which are worded in clear Portuguese, French, or English, and containing the signature of the sender. However, the use of divers codes established by special arrangement is maintained for commercial telegrams. The telegrams are accepted only at the risk and peril of the sender, and they are submitted to censorship, which may entail delay, and no request for reimbursement will be considered.

The use of the Italian language is admitted in correspondence between the Portuguese colonies and Italy, Lybia, and the Italian possessions in oriental Africa.

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OHIO STATE UNIVERSITY

RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, July 1, 1916—No. 19

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WASHINGTON, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the List of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:
E. F. SWEET,
Acting Secretary.

NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Longitude and latitude (approximate).	Call signal.	System.	Range.	Wave lengths.
Cape St. Elias, Alaska ¹	O 144 36 18 N 59 47 48	NLQ	United States Bureau of Lighthouses, 1000. Chaffee arc.....	100	600, 800, 1000, 1200.
Providence, R. I. ²	O 71 25 00 N 41 49 00	WPF		100	300, 425, 600

¹ Service, PG; rates, 6 c. per word 60 c. minimum per radiogram (ship communication, cable count; shore communication, domestic count). Note, Radio station operated and controlled by United States Bureau of Lighthouses, Washington, D. C.

² Service, P; hours, X. Note, Radio station operated and controlled by Dutee W. Flint. The station communicates only with the owner's yacht.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Vessel.	Call signal.	System.	Wave lengths.	Owner of vessel.
Aztec (KZC).....	KZC	Marconi.....		A. C. Burrage.
Bacoi ¹	KJU	Marconi, 1000.....	300, 450, 600	Standard Oil Co. of New Jersey.
Clincher.....	KMC	Marconi.....	300, 600	Clinchfield Navigation Co.
George E. Paddleford ²	WIV	do.....	300, 450, 600	Petroleum Transport Co.
Gettysburg.....	WCK	do.....	300, 600	Moore & McCormick Co.
Halcyon ³	KZL	Chaffee arc.....	300, 425, 600	Dutee W. Flint (yacht).
J. M. Danziger ²	WIV	Marconi.....	300, 450, 600	Petroleum Transport Co.
Josephine.....	KZU	do.....		Joseph Widener.
Norwood ⁴	WSG	Kilbourne & Clark, 500.....	300, 450, 525, 600.	Pacific-American Fisheries Co.
Westoil.....	KJT	Marconi.....	300, 600	Standard Oil Co. of New Jersey.

¹ Range, 150; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram; transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.

² Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co.

³ Service, P; hours, X. Note, Radio station operated and controlled by owner of vessel.

⁴ Range, 250; service PG; hours, X; rates, 4 c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by owner of vessel.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name.	Call signal.	Name.
KJT	Westoil..... b	NLQ	Cape St. Elias, Alaska..... c
KJU	Bacoi..... b	WCK	Gettysburg..... b
KMC	Clincher..... b	WIV	George E. Paddleford..... b
KZC	Aztec..... b	WTW	J. M. Danziger..... b
KZL	Halcyon..... b	WPF	Providence, R. I..... c
KZU	Josephine..... b	WSG	Norwood..... b

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1915, only.]

Station.	Call signal.	Wave length.	Service.	Hours.	Station controlled by—
Bakersfield, Ohio.....	6ZW	<i>200, 425.....</i>	P	X	Lindley Winsor.
Beverly Farms, Mass.....	1ZH	<i>200, 300, 425, 600.</i>	P	X	Wilbur H. Hardy.
Eldora, Iowa.....	9ZI	<i>200, 425.....</i>	P	X	Donald R. Lewis.
Lewiston, Mont.....	7ZC	<i>200, 425.....</i>	P	X	Arthur C. Campbell.
Marlboro, Mass.....	1XS	<i>300, 600, variable.</i>	P	X	Louis Waldo Stevens.
Morgantown, W. Va.....	8XG	<i>650.....</i>	P	X	C. W. Waggoner (West Virginia University).
New Rochelle, N. Y.....	2ZK	<i>280, 425.....</i>	P	X	George C. Cannon.
New York, N. Y.....	2ZA	<i>300, 450, 600.....</i>	P	X	New York police department.
Pierre, S. Dak.....	9ZP	<i>200, 425.....</i>	P	X	Dana McNeill.
Pittsburgh, Pa.....	8XC	<i>1800, 2100, 3000.....</i>	P	X	Carnegie Institute of Technology.
Seattle, Wash.....	7XE	<i>300, 600, variable.</i>	P	X	Marconi Co.
Stillwater, Minn.....	9YM	<i>200, 300, 425.....</i>	P	X	Fred B. Wood, Company K, Third Infantry, Minnesota National Guard.
Vancouver, Wash.....	7ZN	<i>200, 300, 425, 600.</i>	P	X	George H. Wallace.
Washington, D. C.....	3ZW	<i>200, 425.....</i>	P	X	Walther A. Parks.

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
1XS	First district:	7ZC	Seventh district—Continued.
1ZH	Marlboro, Mass.	7ZN	Lewiston, Mont.
	Beverly, Mass.		Vancouver, Wash.
2ZA	Second district:	8XC	Eighth district:
2ZK	New York, N. Y.	8XG	Pittsburgh, Pa.
3ZW	New Rochelle, N. Y.		Morgantown, W. Va.
6ZW	Third district: Washington, D. C.	9YM	Ninth district:
	Sixth district: Bakersfield, Cal.		Stillwater, Minn.
7XE	Seventh district:	9ZI	Eldora, Iowa.
	Seattle, Wash.	9ZP	Pierre, S. Dak.

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name =Name of station.

G. loc. =Geographical location: O=west longitude, N=north latitude.

Call =Call letters assigned.

System=Radio system used and sparks per second.

Range =Normal range in nautical miles.

W. L. =Wave lengths assigned: Normal wave lengths in italics.

Service=Nature of service maintained:

PG=General public.

PR=Limited public.

P=private.

O=Government business exclusively.

Hours =Hours of operation:

N=Continuous service.

X=No regular hours.

m=a. m. (12m=midday).

s=p. m. (12s=midnight).

Rates =Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

Notes =Refer to notes in the Berne list.

OTHER ABBREVIATIONS.

Marconi Co.=Marconi Wireless Telegraph Co. of America.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

- BOLINAS, CAL.**—Range, 3,500; system, Marconi, 420; W. L., 6,100; service, limited commercial; hours, N; rates, cable count, 25 c. per word. Lettergrams \$1 for first 12 words, each additional word 8 c. Week-end letters, \$1.50 for first 24 words, each additional word 6 c. Note, Radio station operated and controlled by Marconi Co. The station communicates only with Koko Head, T. H.
- ELEGAK, ALASKA.**—W. L., 300, 500, 600; service, limited commercial. Note, Station limited to correspondence with ship and land stations of North Alaska Salmon Co.
- FORT SHAFTER, HONOLULU, T. H.**—Strike out all particulars.
- HEEIA POINT, ISLAND OF OAHU, T. H.**—W. L., 300, 600, 1,800, 3,000, 8,000, 9,300, 10,600; service PG and limited commercial; hours, 7.30m–11.30s. Note.—Radio station operated and controlled by Federal Telegraph Co. The station also communicates with South San Francisco, Cal., and Portland, Oreg.; rates, cable count, 25 c. per word to South San Francisco and 29 c. per word to Portland.
- HOLLISTER, CAL.**—System, Composite, 240; service, limited commercial. Note, Radio station operated and controlled by Palmer B. Hewlett. Station restricted to communicate with Oakland, Cal. (KGI).
- HULL, MASS.**—Strike out all particulars.
- INGLEWOOD, CAL.**—G. loc., O 118° 19' 48", N. 33° 58' 04"; range, 500; W. L., 300, 600, 3,300, 4,000; service, limited commercial; hours, 9m–6s. Note, Radio station operated and controlled by Federal Telegraph Co. Station communicates only with San Francisco, Cal., San Diego, Cal., and Phoenix, Ariz.; rates, for 15 words to San Diego, 25 c.; to San Francisco, 40 c.; to Phoenix, 50 c.¹
- JACKSONVILLE, FLA.**—W. L., 300, 450, 600; hours, 6m–8m, 10m–1s. 4s–7s.
- KOGIUNG, ALASKA (KVV).**—G. loc., O 156° 55' 30", N. 58° 52' 30"; range, 250; system, KILBOURNE & CLARK, 1,000; service, PG; hours, 6.30s–9.30s; rates, 6 c. per word, 60 c. minimum per radiogram.
- KOKO HEAD, ISLAND OF OAHU, T. H.**—Range, 2,200; system, Marconi, 420; W. L., 6,200; hours, N. Note, Radio station operated and controlled by Marconi Co. The station communicates only with Bolinas, Cal., and Tahiti, T. H.; rates, cable count, 25 c. per word. Lettergrams, \$1 for the first 12 words; each additional word, 8 c. Week-end letters, \$1.50 for first 24 words, each additional word, 6 c. Tahiti press rate, 20 c. per word.
- LOS ANGELES, CAL. (KLS).**—Range, 1,000; Federal-Poulsen arc; W. L., 300, 600, 1,800, 2,800, 3,250; service, PG; hours, 4m–10s; rates, North and South American service, 6 c. per word, 60 c. minimum per radiogram; transoceanic service, 12 c. per word, \$1.20 minimum per radiogram. Note, Radio station operated and controlled by Federal Telegraph Co. The station also communicates with San Francisco, Cal., San Diego, Cal., and Phoenix, Ariz. Rates, for 15 words to San Diego, 25 c.; to San Francisco, 40 c.; to Phoenix, 50 c.¹
- MIAMI, FLA.**—W. L., 300, 450, 600.
- NEWTON, MASS.**—Strike out all particulars.
- NUSHAGAK, ALASKA.**—W. L., 300, 500, 600; service, limited commercial. Note, Station limited to correspondence with ship and land stations of North Alaska Salmon Co.
- PORIT MOLLER, ALASKA.**—Range, 250; hours, 6.30s–9.30s; rates, 6 c. per word, 60 c. minimum per radiogram.
- SAN FRANCISCO, CAL. (KFS).**—System, Federal-Poulsen arc; W. L., 300, 600, 1,800, 3,000, 3,500; service, PG; hours, 7m–2m; rates, North and South American service, 6 c. per word, 60 c. minimum per radiogram; transoceanic service, 12 c. per word, \$1.20 minimum per radiogram. Note, Radio station operated and controlled by Federal Telegraph Co. The station also communicates with Los Angeles, Cal., San Diego, Cal., and Portland, Oreg.; rates, for 15 words to San Diego, 40 c., to Los Angeles, 40 c., to Portland, 50 c.¹
- SAVANNAH, GA.**—W. L., 300, 450, 600.

¹ See table on p. 5, giving detailed explanation of rates.

- SOUTH SAN FRANCISCO, CAL.**—System, Federal-Poulsen arc; W. L., 300, 600, 1,800, 5,000, 8,000, 10,000; service, PG; rates, North and South American service, 6 c. per word, 60 c. minimum per radiogram; transoceanic service, 12 c. per word, \$1.20 minimum per radiogram. Note, Radio station operated and controlled by the Federal Telegraph Co. The station also communicates with San Diego, Cal., Los Angeles, Cal., Portland, Oreg., and Honolulu, T. H.; rates for 15 words to San Diego, 40 c.; to Los Angeles, 40 c.; to Portland, 50 c.; to Honolulu, 25 c. per word, cable count. Night letters to Honolulu, \$1 for first 12 words, 8 c. for each additional word, cable count. Week-end letters to Honolulu, \$1.50 for first 24 words, 6 c. for each additional word, cable count.¹
- SAN DIEGO, CAL. (KSD).**—Range, 500; system, Federal-Poulsen arc, 250; W. L., 300, 600, 1,800, 2,800; service, PG; hours, 4m-8s; rates, North and South American service, 6 c. per word, 60 c. minimum per radiogram; transoceanic service, 12 c. per word, \$1.20 minimum per radiogram. Note, Radio station operated and controlled by Federal Telegraph Co. The station also communicates with Los Angeles, Cal.; rate, 25 c. for 15 words.¹

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

- ALAMANCE.**—Name formerly *Nevadan*; W. L., 300, 450, 600; hours, X. Note, Radio station operated and controlled by Garland Steamship corporation, owner of vessel.
- ALOHA.**—W. L., 300, 450, 600; hours, X.
- ALVINA.**—Range, 300; system, Telefunken, 1,000; W. L., 300, 600; service, P; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Thomas F. Cole, owner of vessel (yacht).
- ARDMORE.**—Range, 250; system, Marconi, 1,000; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram; transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co. Standard Oil Co., of New Jersey, owner of vessel.
- ARIZONAN.**—Hours, X.
- BAYAMON.**—Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co. Vacuum Oil Co., owner of vessel.
- BRAMELL POINT.**—Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co. Vacuum Oil Co., owner of vessel.
- CAPE COD.**—Range, 150; system, Marconi, 400; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- CORNING.**—Range, 300; system, Marconi, 1,000; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- CORSAIR.**—Range, 150; system, Marconi, 400; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- CUBADIST.**—Range, 300; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X.
- CUSHING (KSC).**—Range, 300; system, Marconi, 1,000; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.

¹ Detailed explanation of rates:

When regular rate of 15 words is—	Additional charge per word is—	Rate for day letter of 35 words in plain English is—	Rate for day letter of 50 words in plain English is—	Rate for night letter of 35 words in plain English is—	Rate for night letter of 50 words in plain English is—
\$0.25	\$0.02	\$0.38	\$0.38	\$0.25	\$0.25
.40	.03	.60	.60	.40	.40
.50	.03	.70	.75	.45	.50

- DAYTON.**—Range, 300; system, Marconi, 1,000; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- EL DIA.**—System, Marconi, 1,000; W. L., 300, 450, 600; hours, N; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- ELMER A. KEELER.**—Strike out all particulars.
- EMELINE.**—Strike out all particulars.
- Eocene.**—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- EXPANSION.**—Range, 20; W. L., 300, 600; service, PG; rates, 4 c. per word 40 c. minimum per radiogram.
- FLORENCE (KYF).**—Strike out all particulars.
- FLORENCE LUCKENBACH.**—System, Marconi, 480; Note, Radio station operated and controlled by Marconi Co. Luckenbach Co. (Inc.), owner of vessel.
- FRANK H. BUCK.**—Range, 150; system, Federal-Poulsen arc; W. L., 300, 600, 1,800. Note, Radio station operated and controlled by Federal Telegraph Co. Associated Oil Co., owner of vessel.
- GALATEA.**—Range, 100; system, Marconi, 240; service, PG; hours, X.
- GLACIER.**—W. L., 300, 600.
- GULFSTREAM.**—System, Marconi, 480; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- HENRY J. BIDDLE.**—Range, 250; system, Kilbourne & Clark, 120; service, PG; hours, X; rates, 4 c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by Columbia Contract Co., owner of vessel.
- HEWITT.**—Hours, 9m-12m, 2s-5s, 7s-9s; strike out rates. (The station conducts general public service, without rates.)
- H. H. ROGERS.**—Range, 200; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X.
- HIRAM B. EVEREST.**—Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co. Vacuum Oil Co., owner of vessel.
- MARQUETTE & BESSEMER No. 2.**—System, Kilbourne & Clark, 240; W. L., 300, 425, 540, 600; service, PR. Note, Radio station operated and controlled by Marquette & Bessemer Dock & Navigation Co., owner of vessel. Station is limited to communication with the *Marquette & Bessemer No. 1* and a coast station at Conneaut Harbor, Ohio.
- MATINICOCK.**—System, Telefunken, 1,000; hours, 9m-12m, 2s-5s, 8s-10.30s.
- MUNSOMO.**—Range, 200; system, Marconi, 1,000; W. L., 300, 450, 600; hours, X.
- MUSKOGEE.**—Range, 300; system, Marconi, 1,000; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- NAVAJO (WNJ).**—Note, Radio station operated and controlled by Marconi Co. Navajo Steamship Co., owner of vessel.
- NEVADAN.**—Name changed to *Alamance*.
- NOMA.**—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- RAMOS.**—Range, 50; system, Fessenden, 260; service, PG; hours, X.
- REUCE.**—System, Kilbourne & Clark, 240; W. L., 300, 525, 600.
- ROCHESTER.**—Name formerly *Yaguez*.
- SAMSON.**—Range, 100; system, Kilbourne & Clark, 120; service, PG; hours, X; rates, 4 c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by Columbia Contract Co., owner of vessel.
- SANTA RITA.**—Name formerly *William Chatham*. Note, Radio station operated and controlled by W. R. Grace & Co., owner of vessel.
- SARNIA.**—Note, Radio station operated and controlled by Marconi Co. Bay Steamship Co., of America (Ltd.), owner of vessel.
- SEGURANCA.**—Note, Radio station operated and controlled by Marconi Co. Seguranca Steamship Corporation, owner of vessel.
- SEWARD.**—Rates, 4 c. per word 40 c. minimum per radiogram.
- SIALIA.**—System, Telefunken. Note, Radio station operated and controlled by Atlantic Communication Co. J. K. Stewart, owner of vessel.
- SIBERIA.**—System, Marconi, 240; hours, N. Note, Radio station operated and controlled by Marconi Co. Bay Steamship Co. of America (Ltd.), owner of vessel.

STANDARD.—Range, 200; system, Marconi, 1,000; W. L., 300, 450, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by Marconi Co. Standard Oil Co. of New Jersey, owner of vessel.

ST. NICHOLAS.—System, Kilbourne & Clark, 240; W. L., 300, 525, 600.

TARANTULA.—Strike out all particulars.

VIGILANCIA.—Hours, X. Note, Radio station operated and controlled by Marconi Co. Gaston, Williams & Wigmore, owners of vessel.

W. B. KEENE.—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram; transoceanic service, 8 c. per word 80 c. minimum per radiogram.

WESTWEGO.—W. L., 300, 450, 600.

WILLIAM CHATHAM.—Name changed to *Santa Rita*.

WYOMING.—W. L., 300, 600.

YAGUEZ.—Name changed to *Rochester*.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KDY, read: Rochester, b; **WKZ**, read: Alamance, b; **WMC**, read: Santa Rita, b. Strike out particulars following the call signals, KVV, KYF, KZD, KZT, WLN, WLO, and WZH.

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to be made to the List of Radio Stations of the United States, edition of July 1, 1915, only.]

ATLANTA, GA.—Strike out all particulars.

CAMBRIDGE, MASS.—W. L., 300, 550, 600.

HARTFORD, CONN. (1ZC).—Strike out all particulars.

NEW YORK, N. Y. (2YM).—W. L., 300, 400, 600, 2400.

SPECIAL LAND STATIONS, ALPHABETICALLY BY CALL SIGNALS.

Strike out 1ZC and 4XG.

MISCELLANEOUS.

INCREASE IN SALARIES OF ALASKA STEAMSHIP CO. RADIO OPERATORS.

The Alaska Steamship Co. has advised the Department that the schedule of salaries of their radio operators has been increased as follows:

Grade.	Former salary.	Present salary.
Junior operator.....	\$50	\$55
Senior operator.....	55	60
Combination operator.....	65	75

A combination operator is one who, in addition to his radio duties, assists in the work of the freight clerk while not on watch in the radio room. The salary of a freight clerk is \$90 per month, and vacancies for this position are filled by promotion from radio operator. By this policy radio operators of this company may rise, by promotion, to the highest position which the company has to offer on board ship.

NEW NAVAL RADIO SERVICE REGULATION.

The Superintendent of the Naval Radio Service announces that, effective on and after July 1, 1916, it will be obligatory on the part of a sender of radiograms to be handled by the Naval Radio Service to indicate in the address of the message the class of vessel it is desired to reach by this service, such as "SS" (steamship or steamer) or "USS" (United States ship), as the case may be. Example:

[Radio.]

John Doe
USS New Hampshire
Charleston, S. C.

This order becomes necessary, owing to the confusion in proper handling of such traffic, inasmuch as a large number of names of ships are the same as those of cities, towns, etc.

The extra word will be charged for and counted in the check.

AMENDMENT.

[To be cut out and pasted in copy.]

The Radio Laws and Regulations of the United States, edition of July 27, 1914, are hereby amended as follows:

Paragraph 126, page 64, amended July 1, 1916, to read:

The code test shall continue for 5 minutes at a speed of 20 words, 12 words, and 5 words a minute, respectively, for the commercial first, second, and lower grades, 5 letters, numerals, or other characters to the word, and to qualify the applicant must receive 20, 12, or 5 words in consecutive order accurately and legibly written. Operators will not be permitted to break or interrupt while receiving or to correct or alter the transcription after it has been submitted to the examining officer.

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RADIO SERVICE BULLETIN

ISSUED MONTHLY BY BUREAU OF NAVIGATION, DEPARTMENT OF COMMERCE

Washington, August 1, 1916—No. 20

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WASHINGTON, January 14, 1915.

To collectors of customs, radio inspectors, and others concerned:

This publication is issued monthly by the Bureau of Navigation, Department of Commerce, and distributed to the United States officers engaged in or concerned with the enforcement of the radio laws for their guidance and instruction, and to those concerned with the operation of Government and commercial radio stations for their information.

The Radio Service Bulletin supersedes the quarterly supplements to the List of Radio Stations of the United States and contains information concerning Government, commercial, and special stations only. Information regarding amateur stations appears only in the annual edition of the List of Radio Stations of the United States.

The bulletin contains tables of new stations, alterations, and corrections under headings, so that the List of Radio Stations of the United States and the List of Radiotelegraph Stations, published by the international bureau at Berne, may be brought up to date. Additions, alterations, and corrections should be entered in these two publications promptly on receipt of the bulletin.

Amendments to or changes in the Radio Laws and Regulations of the United States (edition of July 27, 1914) are printed in this bulletin in such a manner that they may be clipped and pasted in their proper places in that publication.

Items of general interest concerning the enforcement of the radio laws are printed in the bulletin from time to time, as occasion warrants.

E. T. CHAMBERLAIN,
Commissioner of Navigation.

Approved:

E. F. SWEET,
Acting Secretary.

NEW STATIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Station.	Latitude and longitude (approximate).	Call signal.	Range.	System.	Wavelengths.
Beaumont, Tex. ¹	O 94 07 00 N 30 06 00	WOD	300	Kilbourne & Clark, 1,000....	300, 600
Carney's Point, N. J. ² ...	O 75 27 00 N 39 43 00	WPO	100	Composite, 800.....	300, 425, 600
Port Walter, Alaska ³	O 134 40 00 N 55 20 00	KEQ	100	Tyee, 240.....	300, 500, 525, 600
Wilmington, Del. ⁴	O 75 32 52 N 39 44 16	WPP	300	Composite, 200.....	300, 425, 600

¹ Service, PG; hours, 3 s-11 s; rates, 6 c. per word 60 c. minimum per radiogram. Radio station operated and controlled by the Magnolia Petroleum Co.

² Service, limited commercial; hours, X. Radio station operated and controlled by E. I. du Pont de Nemours & Co. Station is restricted to communicate with a station at Wilmington, Del.

³ Service, limited commercial. Radio station operated and controlled by the Alaska Herring & Sardine Co.

⁴ Service, limited commercial; hours, X. Radio station operated and controlled by E. I. du Pont de Nemours & Co. Station is restricted to communicate with a station at Carney's Point, N. J.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

Vessel.	Call signal.	System.	Wave lengths.	Owner of vessel.
Cyrus W. Field ¹	WXS	U. S. Army, 120.....	600	Government.
Harstele.....	KEW	.....	300, 600	J. D. Hardin, jr.
Juneau ²	WAM	Kilbourne & Clark, 120.....	300, 600	Alaska S. S. Co.
Maitland No. 1 ³	WLE	Marconi.....	300, 600	Toronto, Hamilton & Buffalo Ry. Co.
Mariposa ⁴	WHP	Kilbourne & Clark, 1,000....	300, 455, 525, 600.	Alaska S. S. Co.
Seafarer.....	WPL	.....	.....	Seafarer Navigation & Salvage Co.
Theodore Roosevelt ⁵	WCT	Marconi, 480.....	300, 600	Roosevelt S. S. Co.
Valdez ⁶	WAK	Kilbourne & Clark, 240.....	300, 600	Alaska S. S. Co.

¹ Range, 130; service, O. Radio station operated and controlled by the United States Signal Corps, War Department, Washington, D. C.

² Range, 100; service, PG; hours, X; rates, 4 c. per word 40 c. minimum per radiogram. Radio station operated and controlled by the owner of vessel.

³ Service, PG; rates, 2 c. per word 20 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co.

⁴ Range, 200; service, PG; hours, X; rates, 4 c. per word 40 c. minimum per radiogram. Radio station operated and controlled by the owner of vessel.

⁵ Range, 100; service, PG; hours, X; rates, 2 c. per word 20 c. minimum per radiogram. Radio station operated and controlled by the Marconi Co.

⁶ Range, 100; service, PG; hours, X; rates, 4 c. per word 40 c. minimum per radiogram. Radio station operated and controlled by the owner of vessel.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

[b=ship station; c=land station.]

Call signal.	Name.		Call signal.	Name.	
KEQ	Port Walter, Alaska.....	c	WLE	Maitland No. 1.....	b
KEW	Harstele.....	b	WOD	Beaumont, Tex.....	c
WAK	Valdez.....	b	WPL	Seafarer.....	b
WAM	Juneau.....	b	WPO	Carneys Point, N. J.....	c
WCT	Theodore Roosevelt.....	b	WPP	Wilmington, Del.....	c
WHP	Mariposa.....	b	WXS	Cyrus W. Field.....	b

SPECIAL LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Additions to the List of Radio Stations of the United States, edition of July 1, 1916, only.]

Station.	Call signal.	Wave length.	Service.	Hours.	Station controlled by—
Hoquiam, Wash.....	7ZA	200, 300, 425, 600.....	P	X	Donald E. McGee.
Jacksonville, Ill.....	9YH	Variable to 425.....	P	X	Illinois Woman's College.
Lamoni, Iowa.....	9YO	200, 350, 425.....	P	X	Graceland College.
Monterey, Cal. (portable)	6XE	300, 600. Variable.....	P	X	National Radio Co.
Omaha, Nebr.....	9XU	800.....	P	X	Union Pacific R. R. Co.
Pittsburgh, Pa.....	8XK	450, 2,000. Variable.....	P	X	Frank Conrad.
Pottsville, Pa.....	8ZR	200, 425.....	P	X	Cotesworth M. Jackson.
Rapid City, S. Dak.....	9ZR	200, 425.....	P	X	S. R. Halley.
Salt Lake City, Utah.....	6ZI	200, 425.....	P	X	Stephen H. Besley.
San Francisco, Cal.....	6XI	300, 600. Variable.....	P	X	Clarence W. Smith.

SPECIAL LAND STATIONS, GROUPED BY DISTRICTS.

Call signal.	District and station.	Call signal.	District and station.
6XE	Sixth district: Monterey, Cal.	8ZR	Eighth district—Continued. Pottsville, Pa.
6XI	San Francisco, Cal.		Ninth district:
6ZI	Salt Lake City, Utah.	9XU	Omaha, Nebr.
	Seventh district:	9YH	Jacksonville, Ill.
7ZA	Hoquiam, Wash.	9YO	Lamoni, Iowa.
8XK	Eighth district: Pittsburgh, Pa.	9ZR	Rapid City, S. Dak.

ABBREVIATIONS.

The necessary corrections to the List of Radio Stations of the United States and to the International List of Radiotelegraph Stations, appearing in this Bulletin under the heading "Alterations and corrections," are published after the stations affected in the following order:

Name =Name of station.

G. loc. =Geographical location: O=west longitude, N=north latitude.

Call =Call letters assigned.

System=Radio system used and sparks per second.

Range =Normal range in nautical miles.

W. L. =Wave lengths assigned: Normal wave lengths in italics.

Service=Nature of service maintained:

PG=General public.

PR=Limited public.

P=private.

O=Government business exclusively.

Hours =Hours of operation:

N=Continuous service.

X=No regular hours.

m=a. m. (12m=midday).

s =p. m. (12s=midnight).

Rates =Ship or coast charges, in cents: c=cents. (The rates in the international list are given in francs and centimes. For approximate purposes, 1 franc equals 20 cents and 5 centimes equal 1 cent.)

Notes =Refer to notes in the Berne list.

NOTICE.

It will be noted that the additions, alterations, and corrections contained in this Bulletin apply to the List of Radio Stations of the United States, edition of July 1, 1916, which is now in the hands of the printer, although it is not possible at this time to anticipate its delivery. All additions, alterations, and corrections appearing in this and later editions of the Bulletin should be saved and inserted in the new annual list as soon as it is received.

A sufficient number of blank pages will be inserted in the back of the new list in order that these particulars may be clipped and pasted therein, enabling radio operators and others concerned to keep their annual list up to date with very little trouble.

ALTERATIONS AND CORRECTIONS.

LAND STATIONS, ALPHABETICALLY BY NAMES OF STATIONS.

[Alterations and corrections to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

AKRON, OHIO.—System, Composite, 480; W. L., 300, 600, 2000; service, limited commercial.

BURRWOOD, LA.—System, Wireless Specialty Apparatus Co., 1000; W. L., 300, 600, 2200.

DETROIT, MICH. (WOK).—W. L., 300, 600, 2160; service, limited commercial.

HUNTINGTON HARBOR, NORTHPORT, L. I., N. Y.—Strike out all particulars.

PORTLAND, OREG. (KDP).—W. L., 200, 300, 425, 550, 600. Note, Radio station operated and controlled by Charles L. Austin. The station is limited to communication with vessels entering and leaving the port of Portland, or bound to or from Columbia River points, and with amateurs.

PORT MOLLER, ALASKA.—Rates, 6 c. per word 60 c. minimum per radiogram.

WASHINGTON, D. C. (NZY).—Call, NZW.

SHIP STATIONS, ALPHABETICALLY BY NAMES OF VESSELS.

[Alterations and corrections to the List of Radio Stations of the United States, edition of July 1, 1916, and to the International List of Radiotelegraph Stations published by the Berne bureau.]

ACHILLES.—Range, 500; system, Telefunken, 1000; W. L., 300, 450, 600, 750, 950, 1200; service, PG; hours, N; rates, 4 c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by the Panama Railroad Co. Maryland Steel Co., owner of vessel.

ACME.—Range, 150; system, Marconi, 1000; W. L., 300, 600; hours, X.

ADMIRAL WATSON.—W. L., 300, 450, 600.

ALABAMA (WFB).—System, Marconi, 480; hours, N.

ALASKA.—W. L., 300, 435, 510, 600; hours, N.

ALICIA.—Range, 60; system, De Forest arc; rates, 4 c. per word 40 c. minimum per radiogram.

AROLINE.—Range, 200; system, Kilbourne & Clark, 1000; W. L., 300, 440, 520, 600; rates, 4 c. per word 40 c. minimum per radiogram. Note, Radio station operated and controlled by the Pacific-Alaska Navigation Co., owner of vessel.

ATLANTIC.—System, Marconi, 480; rates, North & South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Marconi Co. Wilmore Steamship Co. (Inc.), owner of vessel.

AZTEC (KZC).—Range, 150; system, Marconi, 400; W. L., 300, 600; service, PG; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Marconi Co. A. C. Burrage, owner of vessel.

BAYAMON.—Name, Vacuum.

CITY OF LOWELL.—System, Fessenden, 260; W. L., 300, 550, 600.

- CLINCHER.**—Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Marconi Co. Clinchfield Navigation Co., owner of vessel.
- COLOMBIA.**—Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Marconi Co. Pacific Mail Steamship Co., owner of vessel.
- CONNEAUT.**—Range, 100; system, Marconi, 480; service, PG; hours, X.
- ECUADOR.**—Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Marconi Co. Pacific Mail Steamship Co., owner of vessel.
- ENTERPRISE.**—System, Marconi, 1000; W. L. 300, 450, 600.
- GEORGE E. PADDLEFORD.**—Range, 200; system, Marconi, 1000; hours, X.
- GEORGIANA.**—Name, *Norlina*. Note, Radio station operated and controlled by the Marconi Co. Garland Steamship Corporation, owner of vessel.
- GOV. FORBES.**—Name, *Governor Forbes*; range, 300. Note, Radio station operated and controlled by Ynchausti & Co., owner of vessel.
- GULFOIL.**—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- J. M. GUFFEY.**—Rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- JOHN A. HOOPER.** Note, Radio station operated and controlled by the Marconi Co. W. R. Grace & Co., owner of vessel.
- MARQUETTE and BESSEMER No. 1.**—System, Kilbourne & Clark, 240; W. L., 300, 425, 540, 600. Service, limited commercial. Note, Radio station operated and controlled by the Marquette & Bessemer Dock & Navigation Co., owner of vessel. Station is limited to communication with the *Marquette & Bessemer No. 2*, and a coast station at Conneaut Harbor, Ohio.
- ORLEANIAN.**—Service, PG.
- PERU.**—System, Marconi, 480.
- PETOSKEY.**—Range, 100; system, Marconi, 480; service, PG; hours, X.
- RICHARD.**—Strike out all particulars.
- SATELLITE (KPS).**—Strike out all particulars.
- TATOOSH.**—Rates, 4 c. per word 40 c. minimum per radiogram.
- TORMENTER.**—Range, 100; system, Marconi, 240; service, PG; hours, X.
- VENEZUELA.**—Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Marconi Co. Pacific Mail Steamship Co., owner of vessel.
- WAKIVA.**—Range, 150; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Marconi Co. H. S. Harkness, owner of vessel (yacht).
- WAPAMA.**—Note, Radio station operated and controlled by the Marconi Co. Chas. R. McCormick & Co., owner of vessel.
- WAYFARER.**—Name, *Warrior*; range, 300; system, Marconi, 480; W. L., 300, 600; service, P; hours X. Note, Alexander S. Cochran, owner of vessel (yacht).
- WESTOIL.**—Service, PG; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram. Note, Radio station operated and controlled by the Marconi Co. Standard Oil Co. of New Jersey, owner of vessel.
- WINIFRED.**—System, Marconi, 400; hours, X; rates, North and South American service, 4 c. per word 40 c. minimum per radiogram, transoceanic service, 8 c. per word 80 c. minimum per radiogram.
- W. S. PORTER.**—Strike out system. Note, Associated Oil Co., owner of vessel.

LAND AND SHIP STATIONS, ALPHABETICALLY BY CALL SIGNALS.

KDX, read: Vacuum b; KJF, read: Norlina b; KYW, read: Warrior b; WJA, read: Governor Forbes b.

Strike out all particulars following the call signals KPS, WLG, and WLM.

Strike out particulars following call signal NZY, and insert *Washington, D. C.*, after call signal NZW.

MISCELLANEOUS.

ARGENTINE WIRELESS AND CABLE REGULATIONS.

On May 8 the Argentinian Government promulgated the following decree relating to the transmission of cable and wireless messages proceeding from or destined to Europe, Africa, Asia, or Oceania:

ARTICLE 1. Cable and wireless messages from, for, or in transit through the Argentine Republic, proceeding from or destined to Europe, Africa, Asia, or Oceania, will be accepted at the risk of the senders and submitted to censorship.

ART. 2. Messages the contents of which might affect Argentine neutrality shall not be received.

ART. 3. Any language or speech is permitted for the form of such messages, bearing in mind the restrictions imposed by countries of transit and destination, and, with respect to messages in secret language, those the respective codes of which may have been previously authorized by the management of posts and telegraphs.

It is understood that the provisions of the decree in nowise affect messages to or from the United States nor messages in transit from South American countries.

RADIOTELEGRAPHIC TARIFF FOR SOCIETY ISLANDS.

By a decree of the governor the radiotelegraphic tariff for the Society Islands was proclaimed on May 6, 1916.

The tariff now in effect fixes the local rate at 12 cents a word (10 cents radio charge and 2 cents telegraphic charge from Papeete to the station at Mahina). There is an additional charge of 1 shilling (24 cents) a word for relaying via the radio stations at Apia, Samoa, and Awanui, New Zealand (6 pence (12 cents) per word for each station). To these rates must be added the charges of other systems for the delivery of the message at its final destination. The cost per word from Tahiti to Washington amounts to \$1.11..

COMMUNICATING WITH VESSELS AT SEA—REGISTRATION OF CABLE ADDRESSES.

The tariff also fixes the rate between the colony and vessels at sea. The cost per word in direct communication with a vessel within call of the station at Mahina is: Local charge 12 cents, plus ship's charge of 8 cents. The cost per word in communicating with a vessel by relay through Apia, Samoa, is: Local rate 12 cents, plus 12 cents for transmission by latter station, plus 8 cents vessel's charge, or 32 cents a word. When the communication reaches a vessel through two relaying stations (Apia and Awanui) the charge is: Local rate 12 cents, plus 1 shilling (6 pence for each station), plus 4 pence ship's rate, or 44 cents a word.

The rate of exchange from French to English currency, and vice versa, is fixed by decision of the colonial governor whenever required and in conformity with the international telegraphic regulations.

Under the newly established radio service, the registration of cable addresses in the colony is not provided for. Communications must be fully or sufficiently addressed to permit of the complete identification of the addressee. During the continuance of the war the strict censorship in New Zealand, through which all messages for Tahiti must pass, will not permit the transmission of communications whose

mode of address leaves in doubt the addressee's identity, or if the language of the message is other than English or French. Communications in code (private or international) will, therefore, not be accepted at New Zealand or at Tahiti.

RADIO SERVICE STATISTICS.

Class and number of radio station licenses issued, 1915 and 1916.

Class.	1915	1916	Class.	1915	1916
Commercial ship.....	362	444	Technical and training school....	15	33
General public service, land.....	41	51	Special amateur.....	37	67
Limited public service, land.....	11	17	General and restricted amateur....	3,510	4,875
Limited commercial, land.....	22	57			
Experimental.....	41	57	Total.....	4,039	5,601

The total number of station licenses issued to July 1, 1916, are as follows: 1913, 1,496; 1914, 2,309; 1915, 4,039; 1916, 5,601; total, 13,445.

Grade and number of radio operators' licenses issued.

Grade.	1913	1914	1915	1916	Total.
Commercial extra first.....			18	18	36
Commercial first and second.....	1,932	339	1,635	1,260	5,166
Experiment and instruction.....	8	10	27	30	75
Cargo.....	1	26	112	173	312
Amateur first and second.....	1,841	1,172	3,067	4,199	10,279
Total.....	3,782	1,547	4,859	5,680	15,868

Clearances and inspections of ships by districts.

1916	First, Boston.	Second, New York.	Third, Baltimore.	Fourth, Savannah.	Fifth, New Orleans.	Sixth, San Francisco.	Seventh, Seattle. ¹	Eighth, Cleveland.	Ninth, Chicago.	Total.
Clearances ¹	1,238	3,196	1,293	1,275	915	1,871	879	344	100	11,111
Inspections ¹	544	2,630	550	21	523	1,206	552	53	46	6,125
Inspections ²	27	186	45		65	93	174	150	371	1,111
Total inspections, 1916 ^{1,2}	571	2,816	595	21	588	1,299	726	203	417	7,236
Total inspections, 1915 ^{1,2}	428	2,382	569	13	665	1,517	356	138	84	6,152

¹ Vessels subject to the act of June 24, 1910, amended July 23, 1912, requiring radio apparatus on certain vessels.

² Vessels subject to the act of Aug. 13, 1912, voluntarily equipped with radio apparatus.

The total number of inspections for the fiscal years 1913 to 1916, inclusive, is as follows: 1913, 3,201; 1914, 6,486; 1915, 6,152; 1916, 7,236; total, 23,075.

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